

August 15, 1936

This Week

Chrysler is spending a lot of effort to prepare the future key-men of the company. The company school is of accredited college standing and the interesting story is on page 212 of this issue.

The brakes of English cars are of different design from those used in America. The three outstanding types are described on page 216.

A new development in reamers has been put into practice at Packard. On page 220 the advantages are shown.

The Fiat 500 has been placed in production in both France and Italy and a first hand description of this 35 cu. in. job appears on page 223.

Used Car Stocks Dwindle

Healthiest Dealer Situation in Years Seen As New Car Shortage Helps Trade-in Clean-up

By Harold E. Gronseth

Used cars apparently will not be a source of worry to sales executives of motor companies this summer as many had feared earlier in the year. A good demand, coupled with extra promotional effort, produced a heavy volume of used car business during the spring and early summer months which brought stocks down to what manufacturers consider a comfortable level for this time of the year.

What will contribute further to their reduction is the probability of a shortage of new cars before 1937 models become generally available, giving dealers more time to concentrate on used car selling. A good many dealers

already are drawing upon limited new car stocks that cannot be replenished for a month or more and not to any great extent for nearly two months. There will be a period when many dealers will have, aside from service, nothing but used vehicles to sell.

Used car stocks, with few exceptions, range from three to four weeks' supply. In some quarters they went up slightly last month as pressure on dealers was relaxed, but in general they declined. One of the largest companies reported a very good reduction during July. Some sales officials say their dealers could dispose of more used vehicles than they have and are likely to go into the market to replenish their stocks.

Not infrequently in the past, the clean-up of outgoing models constituted a serious problem that often was worked out by price cuts and heavy over-allowances. The result was an accumulation of high-priced vehicles on dealers' lots and distress selling prevailed in both new and used car departments. There is nothing in the picture to indicate that such will be the situation this year. In fact, manufacturers say their dealers will go into the new model year in the best position they have ever been. Having in many instances completed their 1936 manufacturing programs ahead of schedule, the factories are rushing new model work. So far above expectations were the sales of one company, that it ran out of material for 1936 cars a full

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Sloan Says Motor Upturn Sound

But Government Spending Is an Undesirable and Artificial Stimulation, Warns GM President

General Motors Corp. is deriving an important part of its profits from the inclusion in net income of the company's equities in the undivided incomes of subsidiaries not consolidated, Alfred P. Sloan, Jr., president, revealed in his semi-annual report to stockholders. The corporation's statement for the first half year shows \$9,783,088 as this equity, against total net income of \$140,694,370. The company has investments of \$250,000,000 in such affiliates.

Mr. Sloan took occasion to express once more his views on administration policy. He bitterly assailed government spending on the ground that it is an "undesirable" form of artificial stimulation and that it will have to be paid for in heavier taxes upon business and upon every consumer of goods and services. Mr. Sloan warned that the long term industrial future is "distinctly cloudy" and that caution is needed.

He reported that four fundamentally sound forces have been responsible for

the boom in automobile production and sales. They were a depletion in the inventory of unused automotive miles caused by subnormal depression output, the broadening use of automobiles and trucks in the social sphere, better products at lower prices, and world recovery.

Mr. Sloan said the trend in this country has also been accelerated by "liberal—as a matter of fact, perhaps too liberal—credit terms." This was the only indicated flaw in the soundness of the recovery, excepting the added stimulus given by government spending and waste.

Mr. Sloan reported that salaries and wages of his corporation for the half year were \$185,924,837 of which \$144,476,124 went to hourly rate workers, the highest total since 1929. The total of wages and salaries, said Mr. Sloan, cannot be compared with net profits because net profits are affected by non-manufacturing units and manufactur-

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Toronto Show Nov. 7-14

The dates chosen for the annual Canadian automobile show at Toronto are announced as Nov. 7-14, four days earlier than the New York show which opens Nov. 11. It is expected that several U. S. manufacturers will have their 1937 models on display at Toronto, thus giving Canadians a pre-view of the new products.

N.A.D.A. Move to Detroit Planned

Executive Committee Also Meets with A.T.A.M. Group to Discuss Means of Increasing Cooperation

By Don Blanchard

N.A.D.A. headquarters will be moved to Detroit about Sept. 1 and will be established in the Hotel Statler. The association's executive committee which met this week in the motor city has approved the transfer and the directors are now being polled formally by mail.

Following separate meetings of a committee of local and State dealer association managers named by the Automobile Trade Association Managers and the N.A.D.A. executive committee on Tuesday, the two groups met in joint session Wednesday and approved a program of activities for the N.A.D.A. which is substantially in accord with that recently published in the N.A.D.A. bulletin. The only major change was the addition of an employer-employee relations service for dealers.

The two groups also agreed on general principles upon which the local and State associations would cooperate with the national in augmenting N.A.D.A. membership and in selling guide books. It was agreed that the ultimate objective should be an N.A.D.A. that is essentially an association of associations although it was recognized that this set-up could not be put into effect immediately. For the present, therefore, the arrangements between N.A.D.A. and individual local and State dealer organizations will be extremely flexible to take care of special conditions in different areas.

A uniform price policy for membership and guide book subscription, with this price subject to uniform discount to local and State associations where they assume the direct selling expense, was agreed upon. What these prices are to be has not been determined but a sub-committee was appointed to go over the budget and make recommendations.

The ultimate object of the new set-up is to simplify the association situation from the dealer standpoint. It is hoped that, generally speaking, it will be possible eventually for the dealer to buy one membership. Where this membership is in the local association it will carry with it membership in the State and national organizations and where it is in the State association it will carry national membership with it.

Present at the meeting were Messrs. Lied, Williams, Wangelin, Robey, Mitchell, and Burkholder, representing the N.A.D.A. and Buckman, Stuart, Klugh, Raine, Williamson, Woodward, Fach, and Milan, representing the association managers.

Tire Plants Speed Up Removal

Persistent Labor Unrest Hastens Industry's Migration; Ford Plans Give Concern to Tire Officials

Decentralization programs of major Akron tire manufacturers, which had been relaxed following declaration of a union ban on wildcat or unsanctioned sit-down strikes of union tire builders, have been resumed and accelerated during the past week as result of a recurrence of sit-down strikes at Goodyear and new outbreaks of violence in Akron. Unionist employees of several tire companies are alleged to have reinforced the picket lines of striking street repair workers in Akron and to have incited riotous conditions which led Mayor Schroy to send all available Akron police officers to the scene of the strike and to issue orders to shoot to kill if necessary. The city's acting

fire and police chiefs were suspended by Mayor Schroy for alleged insubordination in failing to execute official orders to disperse the mob which had blocked street repair trucks from leaving the city parking grounds.

For several weeks, up until the latest outbreak, Akron had been free from labor strife and the city's tire factories operated without interruption, producing at capacity to meet the current consumer demand and to replenish inventories and build up reserve stocks of finished goods.

Goodyear directors, it is reported, will meet in Akron Aug. 17 to consider acquisition of a large plant in Michigan which, when equipped, will provide capacity of 10,000 tires daily. The company already has transferred considerable tire building equipment out of Akron and is estimated to have daily capacity in its three subsidiary plants—at Gadsden, Ala., Cumberland, Md., and Los Angeles—of 30,000 tires per day.

Tire manufacturers who at first were inclined to treat lightly the reports that the Ford Motor Co. planned to manufacture its own original equipment tires, now indicate that Ford's plans are more serious than had been surmised. Akron mold manufacturers have been in Detroit for the past 10 days figuring on estimates on equipment to produce 24,000 tires per day. The Ford company now gets the major part of its original equipment tires from the three major Akron firms—Firestone, Goodyear and Goodrich.

Plans of the Ford Motor Co. for manufacture of virtually all of its original equipment tires, call for the most modern and complete tire factory in the country and a two-shift daily capacity of 16,000 tires, it is reliably reported. The plant would be so laid out that with addition of a third shift of workers the daily capacity could be increased to 24,000 tires.

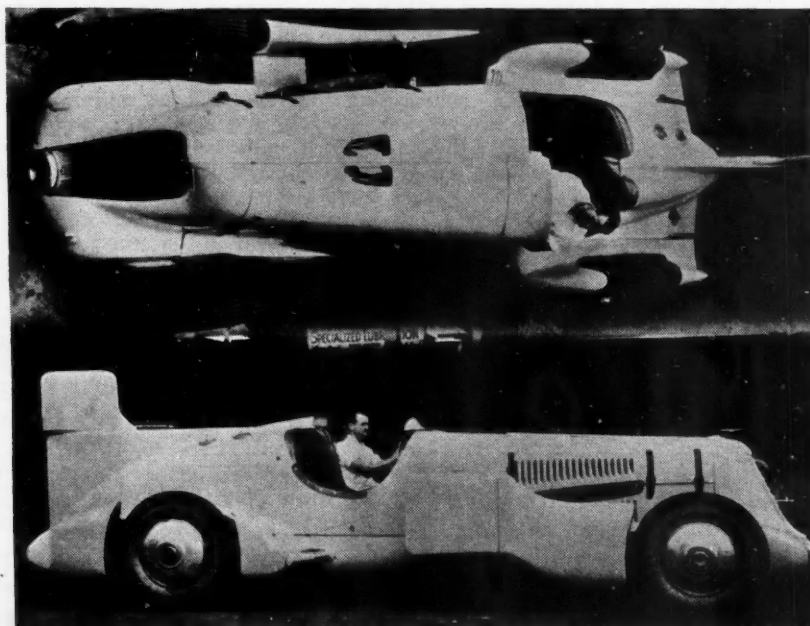
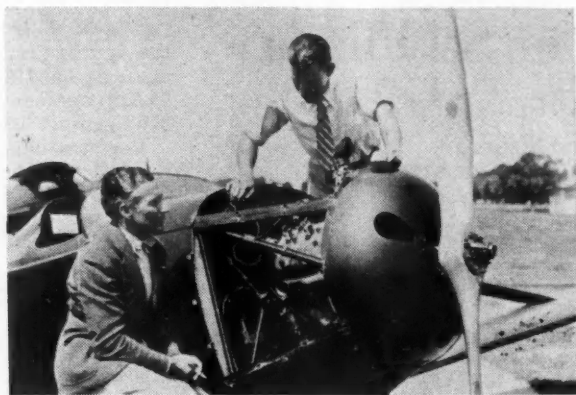


Photo from Pictures, Inc.

In this racer, Ab Jenkins is attempting, at Bonneville Salt Flats, to break the records recently established by Capt. George Eyston

A Ford V-8 Powers This Plane



Acme Photo

The Arrow Model F airplane, powered by a Ford V-8 engine, has been delivered to the Bureau of Air Commerce, Department of Commerce. Eugene Vidal (left), director of the bureau, examines the plane's power plant. The airplane is a conventional low-wing open-cockpit monoplane built in cooperation with the Bureau of Air Commerce in accordance with its program of development of private owner aircraft from the standpoints of utility, cost, comfort and safety. The propeller speed is about 1500 r.p.m. obtained through a 1.95 to 1 reduction gear. Maximum speed of the plane is stated to be 135 m.p.h. and cruising speed 90 m.p.h.



D. G. Roos

Roos Resigns from Studebaker

Delmar G. Roos, vice-president in charge of engineering of the Studebaker Corp. has resigned. Mr. Roos is a former president of the Society of Automotive Engineers and was chief engineer of the Pierce-Arrow Motor Car Co. from 1921 to 1922 and of the Marmon Motor Car Co. from 1925 to 1926.

Convertible Bond Issues for Budd Companies Authorized

Action was taken at meetings of the stockholders of the Edward G. Budd Manufacturing Co. and the Budd Wheel Co. last week to permit the issuance of \$10,500,000 and \$2,000,000, respectively, of 4½ per cent first mortgage bonds, convertible into common stock. The proceeds will be used to liquidate the Budd Realty Corp. and to retire existing mortgage and bonded indebted-

ness of the Budd Manufacturing Co. bearing higher interest.

In authorizing the bond issues, stockholders of the manufacturing company approved an increase of 550,000 shares of no par common stock, while stockholders of the wheel company approved an increase of 135,000 shares of no par common.

Federal Announces Tourist Trailers

*"Motohome" for Dwelling and "Motomart" for Commercial Use
to Be Marketed through Separate Franchises*

Federal Motor Truck Co., in addition to manufacturing its complete line of motor trucks, is now engaged in the manufacture of trailers which are known as "Motohome," for living purposes, and for commercial use, "Motomart," according to an announcement by M. L. Pulcher, president.

A special trailer division of this company entirely separate from the truck sales division has been created for the merchandising and selling of these trailers. George Frank Lord has been appointed sales manager of this division. "Under the present set-up," said Mr. Pulcher, "a dealer's agreement covering the sale of Federal trucks will not carry with it any provisions as regards trailers. The trailer as a separate franchise, however, will be offered to present Federal dealers for their territories. Quite a number of the members of our dealer organization have already become interested in the distribution of Federal trailers and we expect that many more will follow. We will, of course, also appoint other than Federal dealers to handle trailers."

The standard model of Federal Moto-

Lycoming Engines to Power Stearman Planes for Army

Fifty additional training planes have been ordered from the Stearman Aircraft Co., Wichita, Kan., by the U. S. Army Air Corps. The planes will be equipped with 225 hp. Lycoming R-680-5 engines and will have maximum speeds of 125 m.p.h. and a cruising speed of 105 m.p.h.

First plane of a fleet of Boeing model 229 (YB-17) four-engined bombers for the U. S. Air Corps is nearing completion at the Boeing plant in Seattle, Wash. It will be powered by the new 1000 hp. Wright Cyclone engines. Except for certain alterations, the plane will be similar to the original Boeing 299 which made an average speed of 232 m.p.h. last year in a flight from Seattle to Dayton, Ohio. The Boeing 299 had four 750 hp. Pratt & Whitney Hornet engines.

Not to Market Car, Says Montgomery Ward Official

F. M. Folsom, vice-president in charge of merchandising of Montgomery Ward and Co., Chicago, denied officially this week that his company is planning to market at retail a small, low-priced automobile.

The rumor, started apparently by a New York columnist, was to the effect that the Chicago mail order house would soon market a car to "sell at \$345 and do 40 mi. per gal."

home and Motomart has an inside length of 16 ft. 6 in., and contains 104½ sq. ft. of floor space. All available end ceiling curves are so designed that there is no loss of headroom. The floor width of 6 ft. 4 in. continues throughout the full inside length. The chassis frame is all steel, electric welded into one piece. Springs are underslung to a square forged steel axle with a 4-in. drop. A detachable parking jack and caster is mounted back of the coupler. Body frame is No. 1 birch and oak bolted direct to the steel chassis. In Federal Motohome sleeping accommodations for two or four people are provided by Pullman-type bed seats in the rear and a studio couch in the front. The shell of the Motohome is priced separately at \$595 f.o.b. Detroit, including wheels, tires, caster, jack, couplers, windows, two ventilators, screens, screen door, electric wiring and fixtures, radio aerial, safety cables and wheel housing covers. All other interior equipment is listed extra as units so that the purchaser may select an interior arrangement to suit his individual desires.

Automotive Credit on Safe Basis

Finance Company Officials Dispute Sloan's Fear Terms Are Too Liberal

Executives of leading finance companies disagreed emphatically with A. P. Sloan, Jr., president of General Motors Corp., on Mr. Sloan's comment that credit terms applied to automobile purchases are "perhaps too liberal." They felt that rates had to come down to the levels dictated by other money rates in the country, that the low rates alone had not forced heavy time buying of automobiles since there still remains an unfilled need for transportation facilities, and that continued careful examination of applications for credit and attention to servicing the accounts will prevent losses.

Long term financing contracts at low monthly rates should result in no greater degree of loss than the former

12-month standard contracts, it is said.

Commercial Investment Trust Corp. is purchasing installment paper on trailers on substantially the same terms as are applied to automobile paper purchases. The business is small as yet but shows some possibilities of growth.

Sloan Says Upturn Sound

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ing subsidiaries which are not consolidated.

Salient features of the semi-annual financial statements have recently been published in preliminary form. Net income was equal to \$3.17 a share against \$1.85 for the 1935 period. The balance sheet showed cash of \$290,591,894, trade receivables of \$64,248,597, sight drafts and c.o.d. items of \$11,951,591 and inventories of \$166,432,106. Inventories were lower than either six months or a year ago and cash was higher. Current liabilities were much higher due to tax increases.

British Car Sales Make New Records

The automotive industry in Great Britain continues to register impressive gains. Sales of passenger cars in May amounted to 31,641 against 24,960 the year before, commercial vehicles 6771 against 5459 and hackneys, 1148 against 1004, according to the Ministry of Transport returns.

For the first five months of this year

compared with the same period of 1935, the figures are: passenger cars, 142,804 against 128,198; commercial vehicles, 35,319 against 30,359; and hackneys, 3703 against 3245.

Registrations of motor vehicles reached a new high on May 31 with a total of 2,572,345 of which 1,531,449 were passenger cars, 433,531 commercial vehicles and 80,684 hackneys.

Rail-Truck Service Moves 870 Trailers

First month's operation of the co-ordinated rail-truck service between Chicago and St. Paul-Minneapolis over the Chicago Great Western railroad, saw 870 truck trailers transported on flat cars, according to a report given out by the railroad. The Great Western moved trailers for Keeshin Motor Express and member companies of the Illinois-Minnesota Motor Carriers Conference under joint tariffs.

Sealed Power Acquires B-N Piston Pin Jobbing

The Burgess-Norton Mfg. Co., Geneva, Ill., announces the signing of an agreement with the Sealed Power Corp., Muskegon, Mich., whereby the latter firm takes over the inventory and sale of all B-N replacement piston pins on Sept. 1 and effective that date will fill all orders for Burgess-Norton jobbers. The Burgess-Norton Co. is withdrawing only from supplying the jobbers and will concentrate its activities on the manufacture of piston pins for standard equipment and on contract for other manufacturers. An additional number of high speed production machines are being added to the company's equipment.



Photo by Lee F. Redman, Detroit

R. H. Daisley
recently appointed assistant general manager of the Wilcox-Rich Corp.

New Car Financing Up 87% in Year

Total for June Shows Gain of 74%; Average per
New Car is \$579

Retail financing of new cars last June reached the figure of \$129,691,253, an increase of 87 per cent over the \$69,409,989 business done in the same month last year, and eight per cent over the May, 1936, figure, according to estimates of the Bureau of the Census, Department of Commerce. Total volume of retail financing for June was

\$194,945,765, an increase of 5.6 per cent compared with the previous month and of 74 per cent compared with June, 1935.

Wholesale financing dropped slightly to \$178,908,474 from the May figure of \$185,123,097 but was 47 per cent above that of June, 1935.

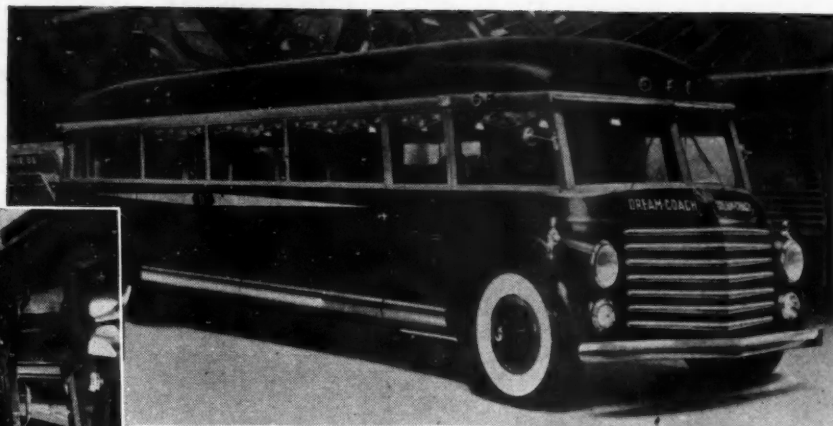
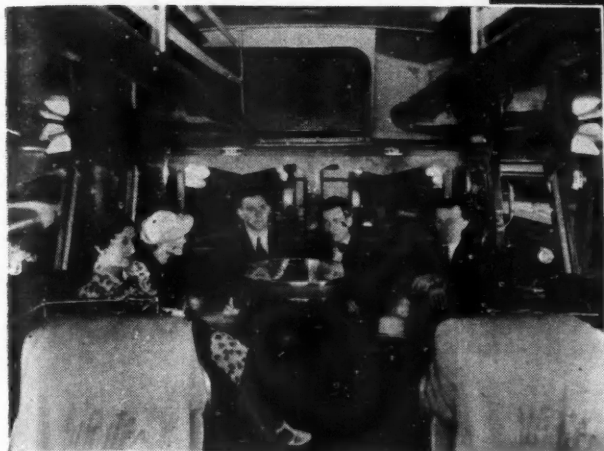
The average amount financed per car

	Wholesale Financing Volume in Dollars	RETAIL FINANCING											
		TOTAL			NEW CARS			USED CARS			UNCLASSIFIED		
		Number of Cars	Total Amount	Per Car	Number of Cars	Total Amount	Per Car	Number of Cars	Total Amount	Per Car	Number of Cars	Total Amount	Per Car
June 1936	\$178,908,474	*480,284	\$194,945,765	\$406	223,861	\$129,691,253	\$579	253,634	\$64,226,560	\$253	2,789	\$1,027,952	\$369
May 1936	185,123,097	460,376	184,574,506	400	207,575	120,193,471	579	250,288	63,329,668	253	3,013	1,051,367	349
June 1935	121,779,041	303,334	111,893,982	369	126,207	69,409,989	550	171,485	40,459,144	236	5,642	2,024,849	359
6 Months 1936	957,240,408	2,240,896	896,254,847	400	1,015,254	582,795,235	574	1,211,657	308,590,685	255	13,985	4,868,927	348
6 Months 1935	774,298,232	1,553,134	573,214,595	369	665,023	360,767,655	542	859,036	201,949,591	235	29,075	10,497,349	361

* Of this number, 46.6 per cent were new cars, 52.3 per cent were used cars, and 0.6 per cent unclassified.

Reg. No. 13641

at retail was \$406 in June, against \$400 in May and \$369 in June, 1935. The average amount per new car remained unchanged at \$579, the highest figure on record.



"The Dream Coach of 1950," White Motor Co.'s contribution to bus progress, is shown at the Great Lakes Exposition in Cleveland.

State Law Affects Dealer Contracts

Wisconsin Commission May Revoke Factory License if Unfair Methods Used in Cancelling Dealer

Revocation of licenses to sell cars in Wisconsin of factories and distributors found to have dealt unfairly with dealers is within the powers granted to the state banking commission by the Wisconsin law requiring finance companies, dealers and salesmen to secure licenses, according to State Senator G. Erle Ingram, special counsel to the commission's division of consumer credit which is administering the licensing law.

In this connection it is reported that a hearing will be held shortly by Supervisor John F. Doyle and Senator Ingram to determine whether an automobile factory, through its Wisconsin distributors, has a right arbitrarily to cancel the contracts of its dealers without bringing up the question of revocation of licenses of such factories and their distributors to sell cars in Wisconsin in the event unfair methods have been used in handling the affairs of the particular dealer cancelled. The attorney general incidentally has held that the licensing law requires both factories and distributors to have licenses in order to sell cars in Wisconsin.

Senator Ingram is reported to be of the opinion that where it is alleged that dealers have been unfairly treated or arbitrarily cancelled the division of consumer credit should hold hearings to determine the fact. It is reported also that at the next session of the Wisconsin legislature, legislation will be introduced requiring the division to hold such hearings.

The subject of dealer cancellations also came up at the recent closed hearing held by the division on rules and

regulations for the administration of the licensing act. A possible recommendation will be that no dealer can be cancelled until after the grounds have been approved by the commission and after the dealer has been heard.

At the hearing, objection was also voiced by the state dealers' association to present f.o.b. price advertising on the grounds that it was deceitful. It was held that prices advertised should cover the cost as pictured or described in the advertisement.

White's "Dream Coach" Exhibited at Cleveland

Center attraction at the White Motor Co.'s exhibit at the Cleveland Great Lakes Exposition is the "Dream Coach of 1950," an ultra-modern bus designed by Count Alexis de Sakhnoffsky. Among the unique features of the vehicle is a complete air-conditioning plant. The double-glazed windows completely shut out heat, noise and dirt, and the temperature, circulation, humidity and purity of the air are controlled automatically. The air-conditioning equipment was manufactured by Kelvinator.

The streamlined exterior of the coach was designed to offer a minimum of wind resistance in motion. A special type of reclining airplane seats equip the bus. Seat spacing is unusually large and both the seat backs and cushions are of a new type of sponge rubber. Deluxe accessories include a radio, indirect lighting, writing desk, divans and a magazine rack.

The bus is powered by an underslung 180 hp. 12-cylinder "pancake" engine.

It permits a low center of gravity and a lower floor height. A five-speed transmission with quiet helical gears in all speeds is another innovation. The body and chassis of the bus are built as a single unit.

AMA Member Shipments Second Best in History

A preliminary factory sales report discloses that more motor vehicles were shipped from the factories of Automobile Manufacturers Association members last month than in any previous July, with the single exception of July, 1928.

Factory sales of association members for July were estimated at 339,755 cars and trucks; a 33 per cent increase over the same month last year and a decrease of seven per cent under June.

On the basis of this estimate, factory sales for association members during the first seven months of this year amounted to 2,301,480 units; an increase of 509,830 units or 28 per cent over the same period last year. Only twice, in 1928 and 1929, has this figure for the seven months period been exceeded.

Caterpillar to Stage Tractor Economy Tests

Tests designed to test the economy of various sizes and types of farm tractors are to be staged by the Caterpillar Tractor Co. at Peoria, Ill., September 3 and 4. Editors of agricultural journals, representatives of middle western State Agricultural Colleges, farmers and farm managers have received invitations to attend as the company's guests.

Used Car Stocks Dwindle

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month earlier than was contemplated. Two companies are now planning mid-September announcements and a number of others will be earlier than they were last year.

Report of the Automobile Manufacturers Association, showing production of 339,755 cars and trucks by members last month, indicates that the industry's July output went to 450,000 units, comparing with 470,887 units in June and 345,297 in July last year.

A survey of Pontiac dealers all over the country shows less than a 30-day stock of used cars on hand. Used car sales in July were 31,235 compared with 35,219 in June and 24,039 in July, 1935. For the year to date Pontiac dealers have sold 207,335 used cars compared with 138,745 used cars during the first seven months last year. July retail deliveries of Pontiac cars in the U. S. totaled 16,564 with 13,289 cars for July, 1935, and 9302 for 1934. In first seven months of this year 112,076 current model Pontiacs had been delivered against 95,694 of the 1935 models in the same time last year.

Sales of Lincoln-Zephyr cars in July were second largest in volume in the brief 10-month history of the new Lincoln product, it was announced by the Lincoln Motor Co. this week. The July total of retail deliveries was 1503 units, compared with 1607 units in April, the largest month from a sales volume standpoint since the new car was announced in November last.

Studebaker dealers in the United States sold 5348 passenger cars and trucks during July, bringing the total for the first seven months to 43,512. This exceeds each of the three previous full years. Total retail deliveries in the United States in 1933 were 39,551; in 1934, 42,917; and in 1935, 43,435.

A nine-year high for July shipments of Cadillac and LaSalle cars is assured by field reports showing that July sales have run at least 35 per cent above those recorded in July last year. Cadillac products in the high price group accounted for 44.9 per cent of all sales in that field during the six months ended June 30, the last for which complete registrations are available. This compares with 38.2 per cent of that price class in the similar period of 1936. For June the figure was 46.1 per cent. Actual unit increase of Cadillac sales for the six-month period was 48 per cent above the half-year total in 1935.

Setting a new all time high for retail sales in July, Oldsmobile dealers last month delivered 18,122 cars, an increase of better than 28 per cent over the previous record made in July last year. Retail sales for the first seven months of 1936 total 128,961, an increase of 28.5 per cent over the same period of last year.



DANIEL J. CONNOLLY, formerly with the Chandler Automobile Co. and recently with Hupp Motor Car Co., Detroit, as general superintendent of painting, has taken a position with the Sherwin-Williams Co. as technical supervisor in Detroit. Mr. Connolly's duties will be to assist the sales department in demonstrating and supervising application of Sherwin-Williams products sold to the automobile and manufacturing trade.

V. K. WHITE has been appointed factory service manager of the Auburn Automobile Co. with headquarters at the Auburn, Ind., plant. He has been with the company since 1929 acting as assistant to A. H. McInnis who recently resigned to take up new duties with the Cord Corp.

DON U. BATHRICK, assistant general sales manager of Pontiac Motor Co., was recently elected president of the Culver Legion, alumni organization of the Culver Military Academy, Culver, Ind. The new Legion president was graduated from the academy in 1914.

RUDOLPH FURRER has been appointed industrial engineer of the manufacturing department of Allis-Chalmers Mfg. Co., Milwaukee. Before serving in the World War, Mr. Furrer was with Allis-Chalmers, and from 1918 to 1932 he was with the A. O. Smith Corp. Following this, Mr. Furrer was with the National Tube Co. acting as assistant to the vice-presidents.

Ford Economy Test Gives 22.789 Miles per Gallon

Operating 24 hours a day for four days over the memorial highway connecting Washington and Mount Vernon,

Va., Washington's ancestral home, a stock Ford V-8 sedan has just completed an economy run, supervised by the Contest Board of the American Automobile Association, in which a fuel economy record of 22.789 mi. per gal. was established, according to the Ford Motor Co.

The test covered 2764 mi. and was conducted at an average driving speed of 29.727 m.p.h., according to the certificate of performance issued by the A.A.A. Contest Board. Oil economy performance was at the rate of 1387.82 mi. per qt.

Important feature of the test was the fact that the drivers, under direction of the A.A.A., were subject to all local traffic and speed regulations including the necessary frequent stops and starts at traffic lights and other intersections so that average driving conditions were duplicated. A total of 152 traffic light stops were made.

M.E.M.A. Index Has Wide Gains

A rise in all branches of the industry included in the index of the Motor and Equipment Manufacturers Association was registered in June. Original as well as after-market shipments showed gains over the preceding month, as well as over June, 1935. The M. E. M. A. current monthly index follows:

	June 1936	May 1936	June 1935
(January, 1925, equals 100)			
Original equipment shipments to vehicle mfrs...	166	163	102
Service parts shipments to wholesalers	151	130	131
Accessories shipments to wholesalers	112	110	103
Service equipment shipments to wholesalers...	115	113	82
Grand Index (composite) of above divisions.....	157	150	119
Index car and truck production	196	200	157
Index general business (bank transactions) ...	79	72	68

Earnings Statements of Automotive Companies

	2nd Quarter 1936	2nd Quarter 1935
Auburn Automobile Co.	145,724*	410,890*
Chrysler Corp.	18,080,297	9,496,127
Federal Motor Truck Co.	123,095†	134,418†
General Motors Corp.	88,108,372	52,219,467
Graham-Paige Motors Corp.	30,408*	311,224*
Hudson Motor Car Corp.	1,551,978	325,367
Hupp Motor Car Corp.	213,586*	1,402,202*
Mack Trucks, Inc.	404,412	132,015*
Reo Motor Car Co.	113	31,544
Studebaker Corp.	900,175	119,511*
White Motor Co.	287,421†	851,573†
Yellow Truck & Coach Mfg. Co.	1,383,389	432,311
Allis-Chalmers Mfg. Co.	1,334,473	577,197
Boeing Airplane Co.	133,982	224,558*
Borg-Warner Corp.	5,138,110†	4,293,655†
Edw. G. Budd Mfg. Co.	339,585	127,394
Budd Wheel Co.	310,087	224,640
Clark Equipment Co.	242,869†	27,065†
Curtis-Wright Corp.	553,341	97,472*
Eaton Manufacturing Co.	751,903	436,688
Electric Auto-Lite Co.	1,503,363	852,515
Evans Products Co.	21,538	6,461
Federal Mogul Corp.	226,085†	90,881†
Gar Wood Industries	454,992
Gemmer Manufacturing Co.	194,744†
Hayes Body Corp.	22,607*	2,936*
McCord Radiator & Mfg. Co.	97,598	53,479
McQuay-Norris Manufacturing Co.	285,951†	267,677†
Murray Corp. of America	682,769	674,630
Stewart-Warner Corp.	622,035	524,428
Thompson Products, Inc.	355,539	218,520
Timken Roller Bearing Co.	2,538,138	2,160,341
United Aircraft, Inc.	197,608
Waco Aircraft Co.	32,031*†	87,732*†
Wright Aeronautical Corp.	343,570	130,419

* Net loss. † 6 Months ending June 30.

Automotive Building Boom

Plant Expansion Becomes General in Automobile, Trailer, Aircraft and Parts Plants

The Corcoran-Brown Lamp Co., Cincinnati, manufacturer of automobile lamps, has let a general contract to the Austin Co., Cleveland, for one and two-story additions, 97 x 125 ft. The cost will be \$100,000 including equipment. The Corcoran-Brown company is affiliated with the Electric Auto-Lite Co., Toledo.

Work is rapidly progressing on the new additions to the Scintilla Magneto Co.'s factory at Sidney, N. Y. These additions, it is said, will practically double the capacity of the plant.

The Timken-Detroit Axle Co. will add to its manufacturing facilities about Sept. 1 by establishing a new plant at Waukegan, Ill., according to Willard F. Rockwell, president. The Waukegan factory, to be known as Plant 5, will be operated as a department under the supervision of the company's Wisconsin axle division, which is located at Oshkosh, Wis.

Construction of a \$250,000 steel and brick addition to the Springfield, Ohio, motor truck plant of the International Harvester Co. has been started and the new building will be completed by Dec. 1, George F. Linder, plant superintendent, announced. The structure will have a floor space of 125,000 sq. ft. Three complete and parallel assembly lines, each 1500 ft. long, will be installed in the building.

Knight Screw Products Co. has announced the purchase of the manufacturing plant of McAleer Mfg. Co. of Detroit. This plant has a floor capacity of approximately two and one-half times the plant now occupied by the Knight company. The company contemplates building an addition to the plant which it has purchased and will equip it with additional machines and equipment to take care of increased business. The new plant will be completed and occupied by Sept. 15.

The rapidly growing demand for tourist trailers is bringing about expansion of manufacturing facilities of many companies in this business.

Auto-Cruiser Co., Inc., Baltimore, has acquired a site on York Road where a one-story unit costing \$45,000 inclusive of new equipment will be built.

Nabors Trailer Mfg. Co., Mansfield, La., has let a contract to build a one-story branch plant at Jackson, Miss., which will be used primarily for assembling. Cost will be about \$35,000 with equipment.

Standard Trailer Co., Elmhurst, Calif., is planning to build a one-story plant at San Leandro for production of trailer parts and assembling complete vehicles. The plant will cost, with its equipment, about \$45,000.

Prosperous conditions rule on the Pacific Coast where automobile assembly plants and aircraft factories

are finding it advisable to add to their buildings and equipment.

Most important expansion on the Coast at this time is that of the Studebaker Corp. which finds that its Los Angeles assembly plant, opened less than a year ago, is already inadequate to supply the Western demand for its cars. An addition of 142,000 sq. ft. has been started and will be completed by Nov. 1. It will step up production capacity from 50 to 100 cars per day and 200 additional workers will be employed.

The Taylor Aircraft Co. of Bradford, Pa., plans to open a Pacific Coast branch factory for assembling planes at the Long Beach municipal airport.

L. A. Young Spring & Wire Co., which acquired the large plant at 3350 East Slauson Avenue, Los Angeles, is starting an addition of 25,000 sq. ft. of floor space. This will be the second addition, the first having given 15,000 sq. ft. more space. The new plant is in partial operation with 150 employees now working.

:SLANTS:

STUDEBAKER VETERAN—A new 1936 Studebaker President cruising sedan was recently given to Simon A. Cruikshank, Plainfield, N. J., who won the Studebaker veteran owner contest. After examining the claims of many veteran owners, Studebaker officials found that Mr. Cruikshank had "the best record of continuous ownership of active Studebaker automobiles over the longest period of time." He bought a 4-cyl. Studebaker touring car in 1904, the year the company turned from making electric to gasoline vehicles. Since then Mr. Cruikshank has purchased

several other Studebakers, four of which he still owns and drives.

ITALIAN RECORDS—Eight aviation records held by the United States were recently lost to Italy. The American aviation industry observes, however, that the records were won by the Italian seaplane Cant Z.506, powered by Fiat A59R engines. These engines are Hornets manufactured by Fiat under license from Pratt and Whitney.

AIR TRAVEL—Scheduled air lines in the United States carried 97,453 passengers and 701,142 lb. of express, and flew 40,252,357 passenger mi. during June, 1936, the Bureau of Air Commerce has announced. The 21 domestic air lines—those operating within the borders of continental United States—also flew 344,433,493 express lb. mi. The total miles flown was 5,619,896. In June, 1935, the 22 companies operating at that time carried 73,896 passengers, 330,970 lb. of express, and flew 31,225,699 passenger mi., 186,310,017 express lb. mi., and a total of 4,993,328 mi.

AIRPLANE HORN—Pennsylvania authorities have required that both a horn and a license plate be attached to an auto-giro under development by the Bureau of Air Commerce, Department of Commerce, which is being built at Willow Grove, Pa., by the Auto-Giro Co. of America. Because it is a "roadable" auto-giro which can be operated on the highway at a speed of about 20 mi. per hr., can be kept in a "garage" at home and driven to and from the airport on the highway, the airplane is subject to motor vehicle regulations.

P. M. Mahler & Co. Moves Offices

P. M. Mahler & Co., foreign sales managers, have moved to larger quarters at 115 Broad Street, New York. The appointments of R. F. Mahler as secretary-treasurer and Fritz Mahler as assistant secretary are announced. Paul Falk has also been appointed assistant to the president.



Architect's drawing of the Los Angeles Raceways which will be inaugurated by a 500-mile sweepstakes to be run Nov. 29.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for **AUTOMOTIVE INDUSTRIES**

General business activity last week was maintained close to the peak level of the preceding week. Industrial building activity during the remainder of this year is expected to surpass that a year ago by about the same margin as operations during the first half of this year exceeded those in the corresponding period in 1935. The rising trend of building costs is encouraging the commencement of postponed building work. With few exceptions, conditions in the drought areas remained unchanged, and there was little rain in the sections between the Appalachian and Rocky Mountains last week. It is estimated that the corn crop, which has been affected by the drought more than any other grain, will be 900,000,000 bu. below domestic requirements.

Carloadings Gain

Railway freight loadings during the week ended Aug. 1 amounted to 747,551 cars, which marks an increase of 16,489 cars above those in the preceding week, a rise of 152,254 cars above those a year ago, and an increase of 134,891 cars above those two years ago.

Food Prices Slightly Lower

Retail food costs declined 0.3 per cent during the two weeks ended July 14, according to the Bureau of Labor Statistics. The current index stands at 84.0, based on the 1923-25 average as 100, as against 84.2 two weeks earlier and

80.2 a year ago. The decline in the current index is due to a fall of 13.5 per cent in the price of potatoes.

Power Output Steady

Production of electricity by the electric light and power industry in the United States during the week ended Aug. 1 was slightly below that in the preceding week but was 14.2 per cent above that in the corresponding period last year.

Lumber Output Higher

Lumber production during the week ended July 25 was 72 per cent of the 1929 weekly average. For the fifteenth consecutive week new orders were below production. The level of output, however, was the highest for any week this year.

Fisher's Index

Professor Fisher's index of wholesale commodity prices during the week ended Aug. 8 stood at 84.3, as against 83.7 the week before and 83.2 two weeks before.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended Aug. 5 showed no changes in holdings of discounted bills, bills bought in the open market, and government securities. Money in circulation increased \$40,000,000, and the monetary gold stock rose \$8,000,000.

Hobbs-Donnelly Export Co. Formed in San Francisco

Formation of the Hobbs-Donnelly Export Co., 1228 Folsom St., San Francisco, Calif., has been announced. The company will function as exporters specializing in the sale of automotive parts, accessories and general lines to the Far East. V. H. Donnelly, formerly export manager of the Morse Export-Import Co. of San Francisco, is president and general manager and H. C. Montgomery, vice-president of the company, is also president and general manager of the Hobbs Battery Co.

Labor Turn-over in June

A decline in the quit rate, no change in the discharge rate and an increase in the lay-off rate characterized labor turn-over in automobile and body plants during the month of June, according to the monthly report of the Bureau of Labor Statistics, Department of Labor. Automobile parts plants reported slightly lower quit and discharge rates and a considerable increase in the lay-off rate. Detailed figures follow:

Monthly Turn-over Rates per 100 Employees Automobiles and Bodies

Class of rates	June 1936	May 1936	June 1935
Quit rate	1.23	1.58	0.99
Discharge rate	0.29	0.29	0.22
Lay-off rate	2.99	2.06	9.64
Total separation rate ..	4.51	3.93	10.85
Accession rate	3.08	3.84	2.01

Automobile Parts

	June 1936	May 1936	June 1935
Quit rate	1.64	1.76	0.82
Discharge rate	0.37	0.42	0.17
Lay-off rate	4.26	2.91	11.95
Total separation rate ..	6.27	5.09	12.94
Accession rate	4.22	5.12	2.90

40 Years Ago

with the ancestors of
AUTOMOTIVE INDUSTRIES

Rumors of patent litigation now begin to be heard both at home and abroad. Companies which believe that they have purchased broad fundamental patents in the new field are bestirring themselves and looking about to see who of the many claimants seems to be trespassing on their exclusive territory. It is more than likely that out of this circumspection a number of important and costly patent suits will grow.

Before entering on such a policy, however, the holders of motor patents would do well to study the history of the electrical trade and the disastrous effect of patent litigation upon its earning capacity. They will find that the leading corporations in that industry have expended in useless patent warfare a sum sufficient to pay magnificent dividends upon their enormous capital stocks. The result is that, in these stringent times, these corporations could pay much better dividends if they had not carried so large a patent account.

—From *The Horseless Age*, August, 1896.

GM Seven Month Sales 1,374,861

July Shipments Only Little Below June's Record
Volume; Foreign Business Off Slightly

July sales of General Motors cars to world dealers topped those reported for July, 1935, by 36,903 units, but fell slightly below this year's June record of 217,931 units.

U. S. dealer stocks showed an increase of 13,977 units, considerably less than the increase of 30,376 units of July a year ago. Totaled from Jan. 1, dealer stocks have only increased by 27,800 units as compared with an increase of 91,765 units the previous year.

A substantial increase in world sales is shown by totals of 1,374,861 units for first seven months of 1936 and 1,-

056,350 units for the same period in 1935. Sales to U. S. consumers of 163,459 units dropped below the June figure of 189,756 units, but rose above the July, 1935, sale of 108,645 units. The sales to foreign dealers showed slight decrease compared with both June this year and July, 1935. However, total foreign sales for the seven month period show a slight increase over sales for the same period last year.

The accompanying table reveals the trend of sales of G. M. cars in domestic and foreign markets for this year and corresponding periods last year.

	July, 1936	June, 1936	July, 1935	Seven Months 1936	Seven Months 1935
Sales to world dealers.....	204,693	217,931	167,790	1,374,861	1,056,350
Sales to U. S. dealers.....	177,436	186,146	139,021	1,155,710	849,245
Sales to U. S. consumers....	163,459	189,756	108,645	1,127,910	757,480
Change in U. S. dealer stocks +13,977		-3,610	+30,376	+27,800	+91,765
Sales to foreign dealers.....	27,657	31,785	28,769	219,151	207,105

August 15, 1936

Automotive Industries

June Registrations Up 31.5%

U. S. New Car Registrations and Estimated Dollar Volume by
Retail Price Classes—June

UNITS				ESTIMATED DOLLAR VOLUME*						
	1936	1935	Per Cent Change	Per Cent of Total		1936	1935	Per Cent Change	Per Cent of Total	
				1936	1935				1936	1935
Chevrolet, Ford and Plymouth.....	237,485	189,590	+ 25.1	64.45	67.64	\$143,400,000	\$113,300,000	+ 26.8	56.59	59.42
Others under \$750.....	55,938	41,248	+ 35.8	15.18	14.72	40,200,000	29,300,000	+ 37.3	15.86	15.36
\$751-\$1000.....	59,564	38,513	+ 54.9	16.17	13.74	49,500,000	32,600,000	+ 52.0	19.53	17.09
\$1001-\$1500.....	13,366	9,460	+ 41.2	3.63	3.37	15,300,000	11,000,000	+ 39.1	6.05	5.77
\$1501-\$2000.....	1,002	200	+400.0	.27	.07	1,700,000	400,000	+325.0	.67	.21
\$2001-\$3000.....	770	908	- 15.2	.21	.32	2,000,000	2,500,000	- 20.0	.79	1.31
\$3001 and over.....	344	390	- 11.8	.09	.14	1,300,000	1,600,000	- 17.7	.51	.84
Total.....	368,469	280,309	+ 31.5	100.00	100.00	\$253,400,000	\$190,700,000	+ 32.9	100.00	100.00
Miscellaneous.....	954	51								
Total.....	369,423	280,360								

U. S. New Car Registrations and Estimated Dollar Volume by
Retail Price Classes—Six Months

UNITS				ESTIMATED DOLLAR VOLUME*						
	1936	1935	Per Cent Change	Per Cent of Total		1936	1935	Per Cent Change	Per Cent of Total	
				1936	1935				1936	1935
Chevrolet, Ford and Plymouth.....	1,204,087	1,013,689	+ 19.0	65.06	69.36	\$726,400,000	\$628,400,000	+ 15.8	56.84	61.97
Others under \$750.....	265,246	206,091	+ 28.5	14.33	14.10	191,100,000	147,400,000	+ 29.7	14.95	14.54
\$751-\$1000.....	294,545	191,625	+ 53.6	15.91	13.11	245,100,000	162,300,000	+ 51.0	19.17	16.00
\$1001-\$1500.....	74,540	38,732	+ 92.7	4.03	2.65	85,400,000	46,100,000	+ 85.1	6.68	4.54
\$1501-\$2000.....	5,738	4,406	+ 30.3	.31	.30	9,900,000	7,400,000	+ 33.9	.77	.73
\$2001-\$3000.....	4,186	4,629	- 9.5	.23	.32	10,800,000	12,700,000	- 14.9	.84	1.25
\$3001 and over.....	2,445	2,350	+ 4.1	.13	.16	9,600,000	9,800,000	- 2.0	.75	.97
Total.....	1,850,787	1,461,522	+ 26.8	100.00	100.00	\$1,278,300,000	\$1,014,100,000	+ 26.0	100.00	100.00
Miscellaneous.....	2,298	418	+450.0							
Total.....	1,853,085	1,461,940	+ 27.0							

* All calculations are based on list price F.O.B. factory of the five-passenger, four-door sedan in conjunction with actual new car registrations of each model. The total dollar volume for the different models is then consolidated by price classes.

New Truck Registrations

				Six Months		Per Cent Change, 6 Mos., 1936 over 1935	Numerical Change, 6 Mos., 1936 over 1935	Per Cent of Total Six Months		
	June 1936	May 1936		June 1935	1936			1935	1936	1935
Chevrolet	19,045	21,443	17,576	113,424	84,196	+ 35.0	29,228	35.38	33.13	
Ford	16,930	17,971	17,385	96,398	97,314	- 1.0	-916	30.08	38.30	
Dodge	7,777	8,507	4,911	43,618	28,696	+ 52.0	14,922	13.61	11.29	
International	6,151	6,704	4,710	34,666	24,431	+ 42.2	10,235	10.82	9.62	
G. M. C.	2,820	3,045	901	11,335	4,932	+130.0	6,403	3.54	1.94	
Diamond T	660	754	572	3,837	3,293	+ 16.8	544	1.20	1.30	
White	464	541	220	2,631	1,501	+ 75.3	1,130	.82	.59	
Reo	325	399	439	1,923	2,565	- 25.0	-642	.60	1.00	
Mack	427	440	103	1,537	728	+111.5	809	.48	.29	
Plymouth	324	285	87	1,514	175	+766.0	1,339	.47	.07	
Studebaker	320	358	218	1,503	1,005	+ 50.0	498	.47	.40	
Federal	287	275	178	1,431	945	+ 51.6	486	.45	.37	
Willys-Overland	239	235	266	1,142	858	+ 33.3	284	.36	.34	
Terraplane	262	240	108	1,015	348	+192.0	667	.32	.14	
Brockway	137	168	113	793	526	+ 50.8	267	.25	.21	
Indiana	135	178	38	765	143	+435.0	622	.24	.06	
Divco	117	141	40	572	146	+292.0	426	.18	.06	
Stewart	113	116	69	561	327	+ 71.6	234	.18	.13	
Autocar	96	109	73	546	398	+ 37.2	148	.17	.16	
F. W. D.	24	35	8	194	97	+100.0	97	.06	.04	
Sterling	28	16	16	94	86	+ 9.2	8	.03	.04	
Twin-Coach	9	10	16	78	54	+ 44.4	24	.02	.02	
Miscellaneous	161	213	196	909	1,299	- 30.0	-390	.27	.50	
Total	56,851	62,183	48,243	320,486	254,063	+ 26.1	66,423	100.00	100.00	

Winslow Buys Springfield Co.

Dallas E. Winslow, Inc., of Detroit, is the purchaser of the Springfield Manufacturing Corp., for a sum indicated at about \$200,000. The Springfield

Co. was successor to Rolls Royce of America. Mr. Winslow, head of the Detroit concern which is interested in several industrial companies, will continue to produce Rolls Royce parts and operate the Brewster & Co., Inc.,

coach plant. He will not produce Rolls Royce cars. Mr. Winslow is also the head of the Pierce Arrow Sales Co. of New York.

Sale of the Springfield company was handled by P. B. Olney, Jr. Assets transferred did not include the Springfield factory itself or cash on hand.

June Canadian Car Output 4% Higher Than Last Year

An increase of four per cent was shown in production of automobiles in Canada in June which was 16,400 against 15,745 in June, 1935, latest government figures reveal. Of the total 14,126 were passenger cars and 3274 commercial vehicles, compared with 12,276 passenger and 3469 commercial in June last year. Cars and trucks made for sale in Canada totaled 10,662 against 9910 the same month a year ago. Customs figures show 982 cars were imported and 4449 exported, compared with imports of 365 and exports of 4873 in June, 1935. Production in May totaled 20,006 cars.

Automobile sales ran high in June compared with the same month a year ago, as revealed by figures on motor vehicle financing compiled by the Government at Ottawa. Vehicles financed in June totaled 18,653 with a value of \$7,343,729, a gain of 45 per cent in value over June, 1935. June figures show a seasonal decline from May, the peak month, when 20,839 vehicles were financed for \$8,566,445.

Official figures of car sales for the first six months show Canadians spent \$76,500,000 for new motor cars and trucks in the period. Of this total, \$63,100,000 went for passenger cars, a gain of 11.7 per cent over 1935, and \$13,300,000 for new trucks and buses. The latter figure is 20.5 per cent over corresponding figures for 1935, due in part to the excellent showing of June, which reported sales 44 per cent higher than in the same month last year.

Canada's imports in June of automobiles from the United States increased from \$227,000 to \$797,000 and automobile parts from \$1,790,000 to \$1,989,000. There was a large increase also in imports from the United Kingdom which rose from \$16,000 to \$54,000.

French Automobile Plants Close for 15-Day Vacation

As a result of the new French law which compels manufacturers to give all employees 14 days' vacation with pay, the automobile manufacturers in the Paris region decided to shut down during the period from Aug. 1-15. The organization of the work in these factories is such that it does not permit sending the men away in rotation, and thus a complete shut-down was decided upon. It is understood that other industries in the Paris region are following the same plan and are shutting down their factories during the same period.

Automotive Metal Markets

Rising Wages Rather than Higher Scrap Prices May Cause New Steel Price Increase

By William Crawford Hirsch

Predictions by producers of another price advance are again to the fore in the steel market. Most of these statements intimate that higher costs will make necessary a rise in selling prices "before the end of the year." From this it may be inferred that first quarter 1937 billings rather than those of the next quarter are what those who forecast higher prices have in mind. Much emphasis is being laid in their arguments on recent advances in the scrap iron market. These, it is admitted, resulted from speculative maneuvers, there having been considerable "short selling" by brokers, by which designation the larger factors in the scrap iron market are known, although they operate for their own account. Some of those who sold short

must now pay higher prices to enable them to make deliveries to the steel mills. This has happened time and again in the past without any effect on prices for finished steel. Moreover, the market for heavy melting steel scrap, which is the key description, while high compared with recent lows, is by no means abnormal. A good part of steel mill requirements is covered by contracts at lower prices, so that reports of steel manufacturers planning construction of blast furnaces to overcome higher scrap prices are hardly deserving of credence.

The other point raised by those who predict higher steel prices is that of rising wage scales. Demands for sharp wage increases are a daily occurrence, and if and when these are in part

granted, they will undoubtedly be passed on to the steel buyer. Meanwhile, however, the fact that automotive demand continues to enable finishing mills to work at a surprisingly high rate and that the outlook for remainder of the year is very promising, puts sellers in the steel market into a highly confident frame of mind. In terms of ingot production, 1936 is expected to end with an output of between 45,000,000 and 46,000,000 tons. In 1929, the peak year, it was 56,000,000 tons. Steel company dividends have not yet reflected this measure of recovery.

Pig Iron—The movement of pig iron to automotive foundries is marking time pending completion of the change-over period. Blast furnace sales representatives look for steadily growing commitments from that quarter to make themselves felt within a few weeks.

Aluminum—Enlargement of one of the smelting plants of the sole domestic producer of primary metal reflects growing demand. Higher wage scales have also been put into effect. The market for secondary metal and alloys is steady, without noteworthy price changes.

Copper—Rising export prices have revived speculation as to the possible imminence of another advance in the domestic market. Interruption of the operation of Spain's British-owned copper mines, the Tinto group, has come in for frequent mention lately, but it is not a very important factor, having produced in the best years only around 50,000 tons, compared with more than 1,000,000 tons in the United States.

Tin—The market is somewhat more settled. The week's opening price for spot Straits tin was 42½ cents, ½ cent up from the previous close.

Lead—Amid active demand, the market displays a rising undertone.

Zinc—Firm and active.

Calendar of Coming Events

SHOWS

Automobile Salon, Oriental Fair, Lwow, PolandSept. 5-15
International Automobile Section, 7th Levant Fair, Bari, ItalySept. 6-21
30th Automobile Salon, Paris, France, Oct. 1-11
Olympia Motor Show, London, England, Oct. 15-24
Czechoslovakia, 26th International Automobile Exposition, Prague....Oct. 16-25
9th International Automobile Salon, Milan, ItalyNovember
National Motor Truck Show (N. J. Motor Truck Assn.), Newark, N. J., Nov. 3-7
Canadian National Automobile Show, TorontoNov. 7-14
National Automobile Show, Grand Central Palace, New YorkNov. 11-18
Scottish Motor Show, Glasgow...Nov. 13-21
International Aviation Show, Paris, FranceNov. 13-29
Boston Automobile Show.....Nov. 14-21
Buffalo Automobile ShowNov. 14-21
Columbus Automobile Show.....Nov. 14-20
Chicago Automobile Show.....Nov. 14-21
Detroit Automobile Show.....Nov. 14-21
Washington, D. C., Automobile Show, Nov. 14-21
Cincinnati Automobile Show.....Nov. 15-21
St. Louis Automobile Show.....Nov. 15-22
Philadelphia Automobile Show, Nov. 16-21
Pittsburgh Automobile Show ...Nov. 16-21
Brooklyn Automobile Show.....Nov. 21-23
Cleveland Automobile Show.....Nov. 21-23
Montreal Automobile ShowNov. 21-23
Kansas City Automobile Show...Nov. 21-29*
Milwaukee Automobile Show...Nov. 22-29
Baltimore Automobile Show...Nov. 26-Dec. 5
28th Automobile Salon, Brussels, BelgiumNov. 28-Dec. 9
Peoria Automobile Show....Nov. 30-Dec. 5*
Natl. Exposition of Power & Mechanical Engineering, Biennial Meeting, New York CityNov. 30-Dec. 5
Automotive Service Industries Joint Show, ChicagoDec. 9-13

* Tentative dates.

CONVENTIONS AND MEETINGS

National Association Power Engineers, Annual Meeting, Chicago, Aug. 31-Sept. 4
American Chemical Society, Semi-annual Meeting, Pittsburgh, Pa., Sept. 7-12
World Power (Fuel) Conference, Washington, D. C.Sept. 7-12
Annual Meeting and Convention of the National Association of Sales Finance Companies, Hot Springs, Va.Sept. 14-16
American Transit Association, Convention, White Sulphur Springs, W. Va.Sept. 21-24
North American Gas Tax Conference, Richmond, Va.Oct. 6-9
5th Nat'l Road Oil and Asphalt Congress, Tulsa, Okla.Oct. 8-9
First Aircraft Production Meeting of the S. A. E., Los Angeles...Oct. 15-17
Annual Meeting of the National Association of Motor Bus Operators, Detroit, Mich.Oct. 15-16
American Society for Metals, 18th Nat'l Congress, Cleveland, O.Oct. 19-23
16th Annual Meeting of the American Welding Society, Cleveland, O., Oct. 19-23
American Gas Association, Annual Meeting, Atlantic City.....Oct. 26-31
American Petroleum Institute, Annual Meeting, Chicago.....Nov. 9-12
National Foreign Trade Convention, ChicagoNov. 18-20
16th Annual Meeting, Highway Research Board of the National Research Council, Washington, D. C. ...Nov. 18-20
International Acetylene Assn., 37th Annual Convention, St. Louis, Nov. 18-20
Natl. Industrial Traffic League, Annual Meeting, New York City....Nov. 19-20

CONTESTS

100-Mile National Championship, New York State Fair, Syracuse....Sept. 12
First Annual 400-Mile International Sweepstakes, Roosevelt Raceways, L. I.Oct. 12
500-Mile International Sweepstakes, Los Angeles RacewayNov. 29



The Fitzgerald Mfg. Co., Torrington, Conn., announces its new catalog covering its lines of gaskets, gasket display accessories and grease retainers. Every effort has been made to give a maximum of accessibility to all information in the directory.*

A new series of bulletins has been released by the Wheelco Instruments Co., Chicago, on the subject of **pyrometric heat control**. A detailed analysis of their recently developed "radio principle" type of pyrometric control instruments is given. The booklets may be obtained direct from the Wheelco company by any interested engineer or executive.

A 48-page catalog of the various types of brushes made by David Linzer & Sons, 10 Astor Place, New York, will be forwarded to those interested.*

"The Story of Manganese Steel" is an interesting folder issued by American Manganese Steel Co., Chicago Heights, Ill. History of the alloy, chemical content, physical properties, heat treatment, etc., are among the subjects treated.*

"Ford Fights the Fumes of 50 Tons of Acid" is the title of an interesting article in Vol. XIV, No. 1 of *Inco*, house organ of the International Nickel Co., Inc.*

A new milling machine accessory folder, issued by the Weldon Tool Co., Cleveland, describes the company's new line of end-mill and shell end-mill holders and adapters for same.*

Iowa State College, Ames, Ia.—A Study of Torque and Its Influencing Factors as Related to Commercial Tapping of Metals, by Harry L. Daasch and John Hug.

* Available through AUTOMOTIVE INDUSTRIES.

Just Among Ourselves

So the Light Turned Red

A FRIEND of ours who was driving through the middle west recently ran across a safety caravan, which consisted of several automobiles painted white and liberally decorated with safety slogans. Attracted by the novelty of its appearance, he followed it for a while.

At one point the caravan approached a traffic light which shifted from green to red rather suddenly—so suddenly that three of the cars in the caravan passed through the intersection while the light was red.

Our friend gasped, then recovering his presence of mind he stepped on the accelerator and shot to the head of the parade. As he came abreast of the leading car he did what you or I would probably have done; he caught the eye of the leading driver and shouted "Say, you're a h— of a safety advertisement."

* * *

Solon Asks For the Moon

UNDER a resolution introduced at the last session of Congress by Representative Palmisano (Dem., Md.) the Bureau of Labor Statistics has been entrusted with a study to determine the feasibility of a tax on labor-saving machinery to support social-security costs.

The resolution ordering the study calls for: "a list of all the labor-saving devices, mechanical and otherwise, such as auto-

matic machinery, machinery in general, conveyors, speed-ups, efficiency methods eliminating loss of time and repetition of motions, monopolies, mergers of industries, and all other means adopted toward reducing the cost of production under our competitive system, put in operation after Dec. 31, 1920."

The Bureau of Labor Statistics has admitted that the terms of the resolution call for more material than is available or collectible on the subject, and also that the Bureau's technique of analysis was inadequate to give clear cut results on information called for in another portion of the resolution, which asks for an estimate of the number unemployed as a result of the installation of labor-saving machinery.

From many points of view the project is one of the greatest sops to union labor that has ever been offered. Admittedly the findings will be limited to partial truths because of inadequate information. It will be possible to trace many cases of unemployment due to labor-saving machinery and efficiency methods, but will the findings show the re-absorption of the unemployed made possible by the development of new industries through the machine?

* * *

Perverted Paraphrase

WE believe that the Bureau of Labor Statistics will stick to factual conclusions in interpreting the data it finds,

but sponsorship of the project by Congress is equivalent to turning the Bureau of Labor Statistics into a private fact-finding organization for the Committee for Industrial Organization headed by John L. Lewis. This because the conclusions will be used inevitably by the C.I.O. as ammunition to promote the passage of 30-hour week laws, and bills for the socialization of labor-saving machinery.

An old phrase, celebrated in the history of the United States, seems to find a perverted paraphrase currently in the words: "Millions for fallacies, but not one cent for truth."

* * *

Studebaker Poised For 1937 Jump

STUDEBAKER has scheduled for Aug. 20 a press preview of its 1937 cars, and has set the formal announcement for Sept. 15, well within the deadline established by gentleman's agreement among members of the Automobile Manufacturers Association.

Apparently, Studebaker will be first in the field with its 1937 announcement. Without violating confidences, it can be noted that the Studebaker announcement will be particularly worthy of study, as indicating many of the trends which will appear in 1937. And incidentally, congratulations to Studebaker for the striking way in which some of the new developments have been individualized.

—H. H.

Chrysler "Tech" Makes



Seventeen men received degrees in Mechanical Engineering in 1935

By Harold E. Gronseth

BECAUSE of the advanced instruction it offers and its authority to grant university degrees, the Chrysler Institute of Technology occupies a unique place in the field of industrial education. No other institution of its kind takes its students through graduate work, and in Michigan it is the only school outside the State university authorized to confer a doctor's degree in engineering.

As its name implies, the institute started out to be strictly an engineering school and was established for the purpose of supplying the Chrysler Corp. with high grade, specially trained technicians for its rapidly growing engineering staff. In fact, during the depression, when most companies were retrenching, Walter P. Chrysler doubled his engineering staff. "It has always stopped raining," was his explanation, "and when it does, we are going to be prepared." So he increased the personnel of the 40 different divisions of his engineering department to 1400 employees, including clerical help, from a force of 700 employed during the good times that preceded the depression. He has said since that he is sorry he did not treble the force. Now no engineer is taken on by the corporation until he has completed the course prescribed by the Institute.

Admission to the Graduate School re-

tated through the several engineering departments and attending classes from 3.30 to 5.30 each afternoon in advanced engineering, thermodynamics, psychology, commercial law, public speaking and economics. Upon completion of the course the graduate is assigned to the department in the corporation for which he appears best qualified and in work acceptable to him. Including a new class being formed the graduate school has an enrollment of 98.

Extension of the institute's activities came about through demand from employees. Young engineers who had not had the advantages of academic train-



quires at least a Bachelor of Science degree in Engineering. Only outstanding graduates of accredited engineering schools are accepted by the Educational Committee for this course. Two years are devoted to the graduate being ro-

Men for Chrysler

ing envisaged competition from the college graduates that were being groomed for important engineering jobs, and were covetous of the opportunities opened to "the outsiders." When their feelings became known to the management, provisions were made for establishment of night courses for regular employees in the engineering department and a beginning class of 40 was picked.

Once launched on a spare-time educational program, expansion was rapid. A high school course was established which offered opportunity to employees who wished to obtain high

All new engineers are drafted from its graduates. The school confers doctor's degrees in engineering and combines academic study with factory practice. Since its organization in 1931 it has expanded to a present enrollment of about 1200.

This picture was taken at the first Commencement Day Banquet in 1933



tory work they petitioned authorities for college subjects. The institute then decided to incorporate; so on June 3, 1933—two years after its inception—it obtained from the State of Michigan a charter which gave it authority to confer degrees in engineering. The Institute has also been authorized by the Detroit Board of Education to conduct courses and issue diplomas in preparatory school work.

In September, 1933, the School of Business Administration was organized to provide training in the fundamentals of business and commercial administration for the non-technical employees of the corporation. A School of Business Training also was established for employees interested in increasing their proficiency in clerical and secretarial occupations as well as providing a commercial high school course for employees who require preparatory training for admission to the School of Business Administration.

At the first commencement exercises in June, 1933, an honorary degree of Doctor of Mechanical Engineering was conferred on Walter P. Chrysler in recognition of his achievements in the engineering field. So far, no other doctor's degree has been granted but 80 students have completed the graduate course and have been given the degree of Master of Mechanical Engineering. Being on a spare time pro-

school credits while acquiring proficiency in subjects required in their work or to improve their general education. Courses were planned in mechanical drafting and body designing. As students completed their prepara-



Dean John J. Caton was formerly professor of automotive engineering at the University of Detroit. He was with the Bureau of Standards in Washington and has a background of practical engineering.

gram, those taking the full college course leading to Bachelor of Science degree necessarily have a long road to travel. Only two who entered with advanced credits have completed this course to date, but many more are on the way. Diplomas have been issued to 150 who completed the requirements of the high school course; some 50 students are working for certificates in mechanical drafting and body designing; and about 100 students are entered in the School of Business Administration. There are three classes in executive public speaking in which 90 are enrolled. The class in business correspondence has 158 members.

All told approximately 1200 students are enrolled in the various courses being given by the Chrysler Institute of Technology. Employees of any age are eligible to night school. During the first year over 500 registered. Many more applications were received than could be accepted and it was found necessary to admit employees according to seniority with the corporation. First year employees had to be eliminated. The average age of night school students is 32.5 years, while graduate students range from 22 to 30 years of age.

Directing the Chrysler educational activities is Dean John J. Caton, who holds a doctor of science degree from the University of Pennsylvania. He came to the Chrysler Institute from the University of Detroit where he had been professor of automotive engineering. Previous to that he had been with the engineering and research departments of the McCrosky Tool Co., Meadville, Pa., and with the Bureau of Standards in Washington.

Administrative officers of the Institute are F. M. Zeder, president; O. R. Skelton, vice-president; Carl Breer, vice-president; and J. J. Caton, secretary-treasurer.

Candidates for the graduate school are selected by the Educational Committee of which W. P. Chrysler is chairman. Other members of the committee, men who occupy high execu-

tive positions with the corporation, principally in engineering departments, are K. T. Keller, Carl Breer, H. T. Woolson, W. L. Mitchell, A. C. Staly, W. H. MacDuff, J. C. Zeder, G. L. McCain and J. J. Caton.

Certain measuring sticks are used in selecting candidates. Dean Caton holds that no profession has more misfits than engineering and lays this to the engineer's lack of contacts with the liberal arts, which prevents him as student from "finding himself." It is one of the big aims of the school to readjust misfits—to cultivate and develop further those who are fit.

In picking candidates, the committee starts with the premise that men must be endowed by nature to be engineers. For that reason great weight is given native ability. Such points are considered as resourcefulness, imagination and personality. Of these qualities, the last is considered most important for, as Dean Caton says, "personality is nature's letter of credit written across the face of a man." A transcript of the applicant's college record gives his academic background. Some idea of the caliber of the men selected for graduate training may be had from the records of 30 men recently chosen by the committee from a list of 4000 applicants. Every member of the new class has a Master of Science degree; 14 of the 30 have doc-

tor's degrees; one was a college professor.

The graduate school has 16 instructors—all college men, some former college professors. The instructors are employed in the various departments of the corporation and teaching

is only part time work. Students of the graduate school act as instructors or tutors to undergraduate students. In some cases they have for their pupils at night shop foremen who are their instructors by day. The night school has a faculty of 96—all Chrysler employees and not full time instructors. Night school classes meet from 6.30 P. M. to 10.30 P. M. five days a week. There are 13 teachers in mathematics alone conducting 16 classes; as many as nine classes meeting in one evening.

In rotating the graduates through the plant it not infrequently happens that a department head desires to retain a student who has shown outstanding ability in the work of that department, but he is not permitted to do so until the student has completed the rounds of all departments. And then only if the student prefers to begin his career in that particular department. Conversely, if a student fails in some department, little attention is paid to it as it is not unlikely that he will show exceptional progress in another. Some of those who have completed the course are now department heads. Others have important engineering developments to their credit, as for example the hydraulic brake fluid and motor air cleaners used on Chrysler cars.

No tuition is charged any student of the Institute. A nominal fee is required of those taking laboratory work and this deposit, minus any deductions for breakage, is refunded at the end of the course. Graduate students are paid a liberal living wage during their two year course.

The old general office of DeSoto Motors, adjacent to the Chrysler plant on Oakland Avenue, Detroit, is devoted exclusively to the Institute, housing 22 class rooms, spacious physical and chemical laboratories and drafting room.

The Horizons of Business

By Joseph Stagg Lawrence

Can Uncle Sam Duck This One?

A GENERATION ago Europe was in the throes of a conflict which ultimately engulfed the United States. The costs of that conflict are not calculable, though many efforts have been made to estimate the billions of dollars and millions of lives which were lost. The difficulty inheres partly in the magnitude and scope of the primary costs, but mostly in the damages resulting from secondary effects.

A large share of the responsibility for the depression must be laid at the door of the Great War. It led to maladjustments so profound that they are only now in process of correction.

For example: War places a premium upon food. Armies in the field are notoriously extravagant. It takes much more to feed nations at war than to sustain the same peoples on a peace basis. At the same time that demand expresses itself so imperatively the supply of food is checked. Man power must be transferred from the field to the front. The iron and steel destined normally for plow shares takes the form of machine guns and artillery.

Demand For Food

While this distortion of supply and demand in basic food develops, government exchequers experience terrific strains. Because it is necessary to maintain national enthusiasms at an hysterical pitch it is unwise to tax citizens too heavily. Taxation tends to dampen the ardor of the patriot. Under these circumstances, to wit, an abnormal demand for food and a subnormal capacity to produce it, while the Fisc is forced to treat the taxpayer with the most delicate consideration for the duration of the emergency, there is invariably a resort to some form of inflation followed by a rapid rise in the cost of living. The farmer as the producer of food is exposed to extraordinary pressure, in fact, the greatest pressure which he can experience, namely, that of increasing profit. The rise in the price of farm products is swiftly reflected in advancing land values. This is followed by the culti-

vation of inferior areas which can be made to produce.

Drought

It was under such conditions that the Great Triangle area in Wyoming and the Dakotas was given to the plow. The accident of rainfall during a succession of war years, plus the granting of liberal credit through the newly organized land banks, changed a vast area from range to cultivated land. This "war baby" is today the heart of the drought area. As a drought sufferer it is a dependable performer. Thus the millions which a solicitous government is pouring into this parched country and the distress of the victims is distinctly a war cost. Without the war and its vital summons to the soil the Great Triangle area would now be a sparsely settled range country with a type of farming adjusted to its normal, scanty rainfall. The country would be spared an annual lament.

Other Secondary Effects

The secondary effects of the war can be traced in other fields. We know that construction moves in great cycles approximately 25 years in duration. The bottom of such a cycle seemed to have been reached about 1915. A revival in construction might reasonably have been expected during the period 1916-1920. However, housing is a postponable necessity and our energies were required for other purposes. When the building boom started in the early twenties it developed with exaggerated intensity. Construction materials and labor never recognized the armistice. The abnormal values which building costs imputed to real estate were partly responsible for the loans which financial institutions carried. To the postponement of the construction cycle we may impute a host of ills that clustered about construction and real estate during the post-war period.

The flow of capital to Europe after the war probably constitutes another of the great roots of depression. For a

decade Europe enjoyed annually an average buying power of a billion dollars, the proceeds of foreign securities which American individuals and institutions purchased. Here is another stimulus which helped to create the illusion that America had attained a new era.

Unseen Costs

These are sobering reflections on a heroic but thoroughly futile national gesture. The lives lost and the initial cost have been earnestly dramatized. With which there can be no quarrel. We merely suggest that the unseen costs of a great war may be as serious as those which we tabulate, immediately after the smoke has cleared, in terms of casualties and debts. The depression which, we believe, must be attributed in part to the Great War undermined the nation's confidence in its institutions to such a degree that a political opportunist has been able to effect a bloodless revolution. He has entrenched himself so firmly that many doubt the ability of the electorate to dislodge him. The integrity of great groups has been undermined by mass bribes, the moral fiber of millions of workers corrupted by "relief." The will to dislodge him may have suffered irremediable atrophy. If the depression leaves us a mongrel state, part Communism, part Fascism and part demagoguery then the cost of the war will indeed have been appalling.

The Stage Is Set

We submit these observations because the world seems ripe for another Armageddon. The civil conflict in Spain reaches far beyond the shores of the Iberian peninsula. It is a conflict between systems of thought, of social philosophies, as profound in their penetration and as far reaching in their interest as the great religious conflicts at the close of the Middle Ages. The sympathy of Italy and Germany is clearly on the side of the rebels. France is divided even as Spain. England fears for her dominion in the Mediterranean. Russia openly offers encouragement to the government of Spain and would doubtless extend more material aid if she dared. Her position precludes the

(Turn to page 230, please)

Three Braking Systems

By C. Hayes

AN examination of the braking systems on British cars reveals many features not to be found on American cars. The manufacture of brake assemblies and, in some cases, the brake actuating mechanism, has in recent years become so specialized that it is not surprising to find that the majority of British car makers are now fitting proprietary makes of brakes, the notable exceptions being Ford and Vauxhall. Excluding these latter, we are concerned with three braking systems:—

- (a) Girling Brakes.
- (b) Bendix Brakes.
- (c) Lockheed Brakes.

The first two are mechanically operated, since the hydraulic operation of Bendix brakes, so popular in America, is not found on any British car, while in the last we have hydraulic actuation. The Girling brake, which so far is only to be found on British cars, is of fairly recent introduction, but it has made

remarkable headway and is now fitted to quite a large number of important makes.

Bendix brakes are of two types, one being the cable-operated cam type that has been made for many years in both England and America, the other a new type which has only recently been put on the market in England and which is somewhat similar in operation to the Girling brakes, except that it has self energizing shoes.

The Bendix Company has recently introduced a device which limits the amount of braking effort that can be applied to the rear wheels, dividing the braking effort according to the weight distribution that occurs during braking and at the same time giving some measure of security during panic braking.

The Lockheed brake is similar to the hydraulic brakes so extensively fitted to American cars. Stepped wheel cylinders, either to give even lining wear as on the Chrysler, or to give more power as on the Studebaker, are not yet found on English cars. A recent innovation in connection with hydraulically-operated brakes is the use of what is called a tandem master cylinder which enables the brakes on one axle to continue to function even if those on the other axle become inoperative due to leakage of fluid.

Girling Brakes

This proprietary make of brake is being fitted on an increasing number of makes of cars, Austin, Daimler, Rover and Lagonda being representative of the firms that fit it on some or all of their models.

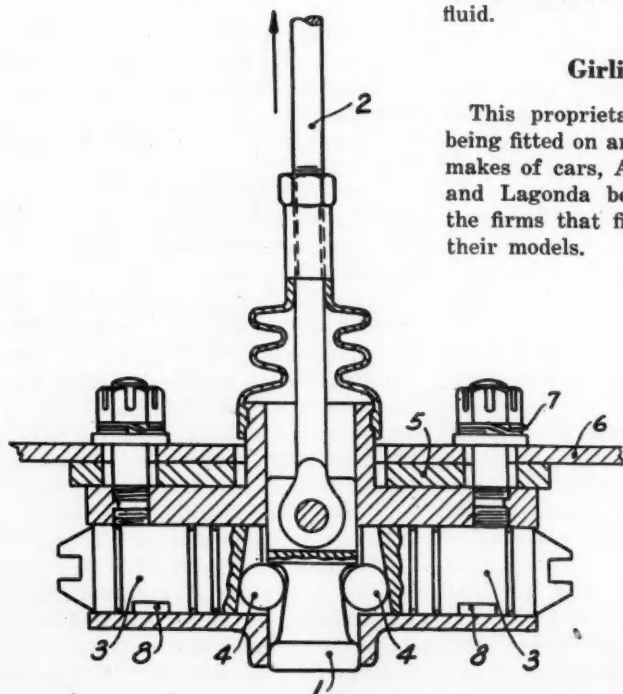


Fig. 1 — Adjusting device used on the Girling brakes

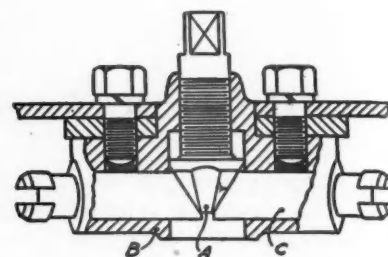


Fig. 2—Single point adjuster incorporated in the shoe-abutment of Girling brakes

The brake assembly is of the conventional two-shoe type, with one pair of adjacent ends abutting against a fixed anchor, the other pair being expanded by a wedge operated by a pull rod at right angles to the backing plate and which is connected to the brake pedal and the brake lever by mechanical means. It is in the brake-expanding device and its method of operation that many of the advantages of the system lie.

A typical brake assembly has the shoe abutment, which also includes the adjusting device, at the top, the brake expander at the bottom.

This latter device is shown in detail in Fig. 1. In contact with the web of the shoes, which are of T-section steel, are the plungers 3 which have their adjacent faces inclined. Between these inclined faces is a hardened steel cone 1 with sides parallel to these on the inclined surfaces of the plungers. Interposed between the cone and the plungers are two hardened steel rollers 4 which reduce the friction to a minimum. The whole expander mechanism is inclosed in a die-cast housing 5 which retains a supply of lubricant and protects the moving parts from mud, rain, etc. This housing, which is mounted on the backing plate 6 by studs and spring washers 7, is capable of a slight circumferential movement, hence it is not stressed by the application of the brakes as it virtually floats between the brake shoes, the spring washers 7 providing a slight frictional contact with the backing plate.

Rod 2 has a pivoted connection to the cone and is capable of movement in a horizontal plane. A leather seal, while permitting the movement, effectively excludes dust and dirt.

Dominate British Market

Movement of the pull rod in the direction indicated by the arrow, causes the plungers (and hence the shoes) to move outwards and so bring the shoes with their linings into contact with the drum. On release of the tension in rod 2, the shoes return and are self-centering under the influence of the release springs.

An interesting point is that the rollers 4, which are freely mounted, roll up grooves in the plunger and down the inclined face of the cone. This free mounting causes the cone to move twice the distance of the rollers and thus doubles the overall leverage due to the cone angle. This results in a high step-up ratio, so that a low input effort from the pull-rods results in a considerable shoe-tip effort and hence braking torque.

The housing is self-contained, even with the brake shoe removed, since the pins 8 retain the plungers in position.

The single-point adjuster, which is

Automobile manufacturers with two exceptions are fitting cars with proprietary makes of brakes peculiar to the English field

incorporated in the shoe-abutment device, operates on both shoes. As may be seen from Fig. 2, it consists of a hardened steel cone A, the spindle of which has a fine thread and is carried in a steel housing B which is piloted by and firmly bolted to the backing plate. Flats are machined on the outer end to take a wrench while on the inner coned face are cut four flats of a predetermined depth.

The cone engages two plungers C which have a bearing in the same hous-

ing, the outer ends of the plungers being grooved to take the web of the shoes.

The housing and cone are cadmium-plated, and as the thread of the cone spindle always remains in the housing, it is adequately protected from damage. The method of adjustment is as follows:—

The cone is turned in a clockwise direction until a resistance is felt due to the shoes coming in contact with the drum, and it is then "slacked back" to

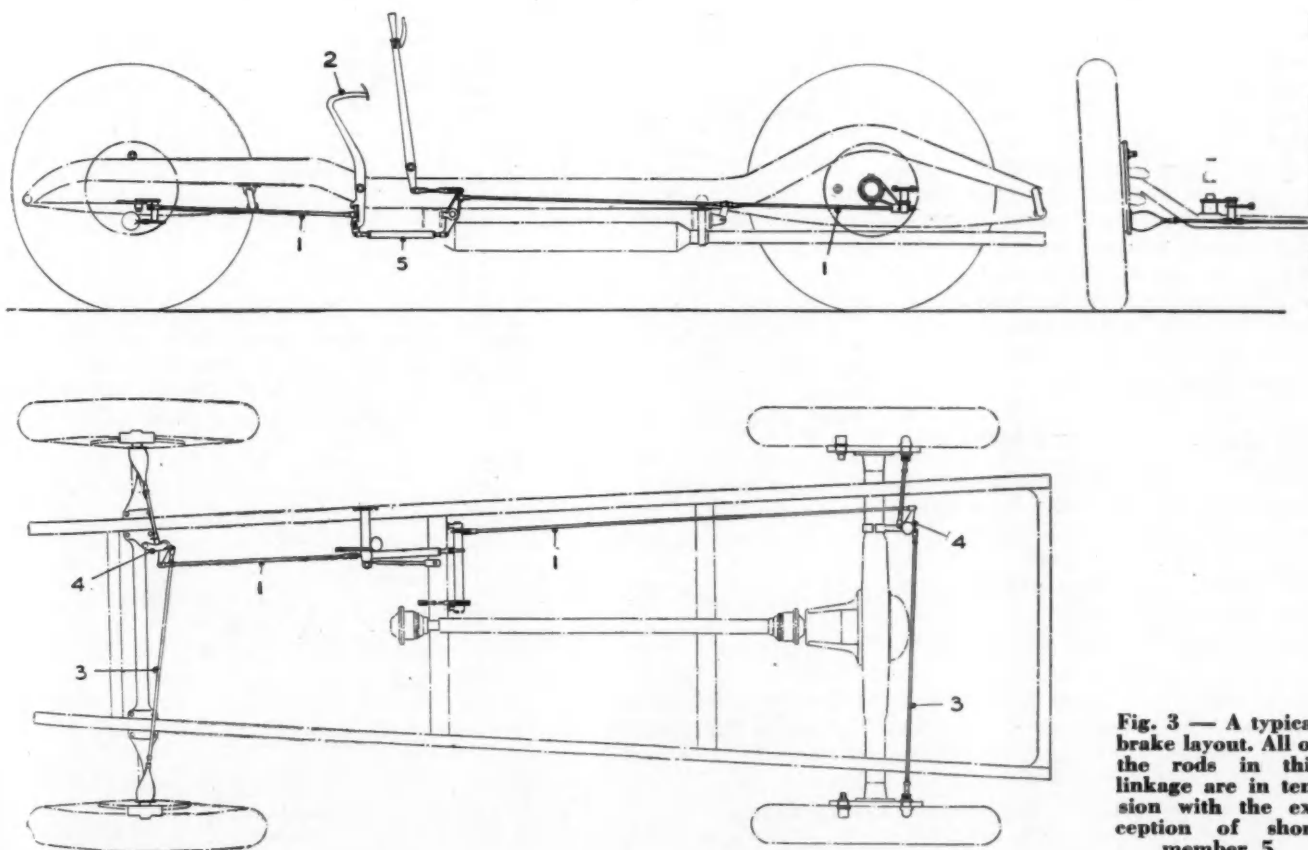


Fig. 3 — A typical brake layout. All of the rods in this linkage are in tension with the exception of short member 5

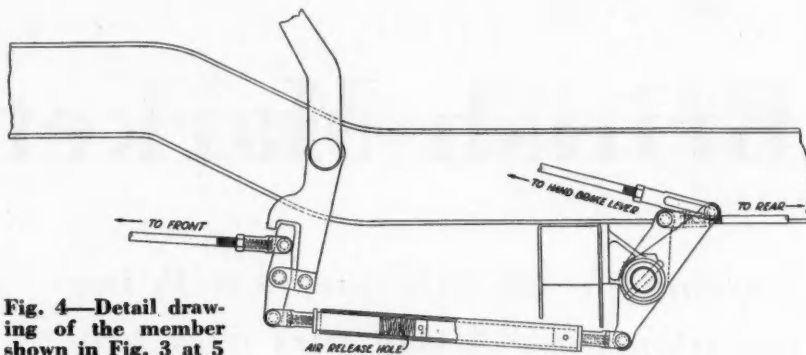


Fig. 4—Detail drawing of the member shown in Fig. 3 at 5

the nearest notch, which will give the clearance required. It is unnecessary to jack up the wheels while making the adjustment, and, further, one adjustment corrects both shoes.

Another feature is that the plungers work in cylinders which are inclined to one another and the shoes are moved in such a way that the bedding of the linings is not affected.

The brake assembly described above makes possible a very simple brake linkage. A typical brake layout is shown in Fig. 3. All the rods in this linkage are in tension, with the exception of the short member 5, which is in compression. Its construction is shown in Fig. 4. It is a tubular member and contains a light compression spring and sliding joint which maintains a light tension in all rods and so prevents rod rattle. Such an anti-rattle device is made necessary by the fact that all clevis pins are fitted to jam ends with a definite clearance, which has been found to reduce the friction considerably and also eliminates the need for lubrication.

This system of linkage has the advantage that it comprises no cross shafts on torsional members, so that one of the chief causes of ineffective pedal travel and uneven braking is eliminated. Further, since the leverage between the pedal and the shoe expander is low, the tension in the rods is low and is also evenly distributed.

Bendix-Cowdrey Brakes

The advantages of the wedge-type of operation for mechanically-actuated brakes are now so well appreciated in England, that the Bendix Company has recently introduced a system which uses this same principle. The wedge expanding method used by Bendix, as

shown in Fig. 5, is rather different from that used by Girling. We again have plungers whose adjacent faces are inclined to one another and whose other ends contact with the web of the shoes. The inclined faces are separated by two steel balls which are in contact with

rotation of the drum, abuts against the housing, the shoes in this case being of the self-energizing type.

This brake is fitted to the new line of Standard cars recently put on the market.

The Bendix Company continues to make their self-energized brake operated by cam and cable, which is fitted to such cars as the Humber, the Hillman, certain Standard models, etc.

Bendix-Auto Brake Control

A device has been introduced recently by Bendix to alter the proportion of braking between the front and rear wheels when a certain rate of retardation is exceeded. For deceleration up to 16 ft. per second per second, the braking force is equally divided between the two axles. At this point the Auto Brake Control comes into action, with the result that any further braking force is applied to the front wheels

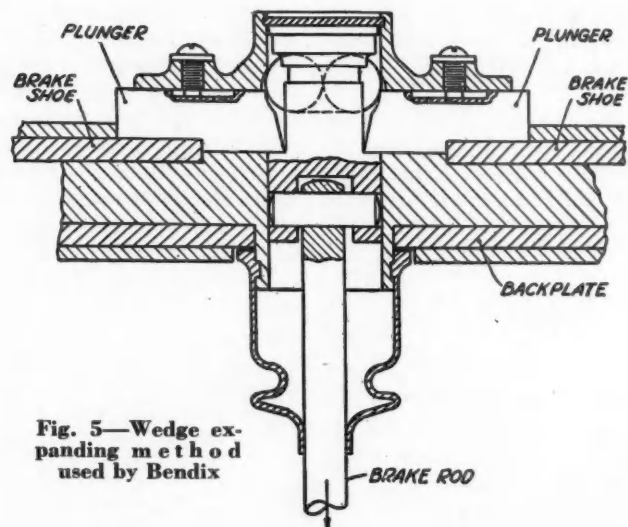


Fig. 5—Wedge expanding method used by Bendix

one another and which are pulled toward the backing plate by a plunger head connected to the brake rod, as shown. One or the other of the brake shoes, according to the direction of

alone. This prevents locking of the rear wheels which under normal conditions is likely to occur when the brakes are applied hard, due to the weight transfer that takes place under these

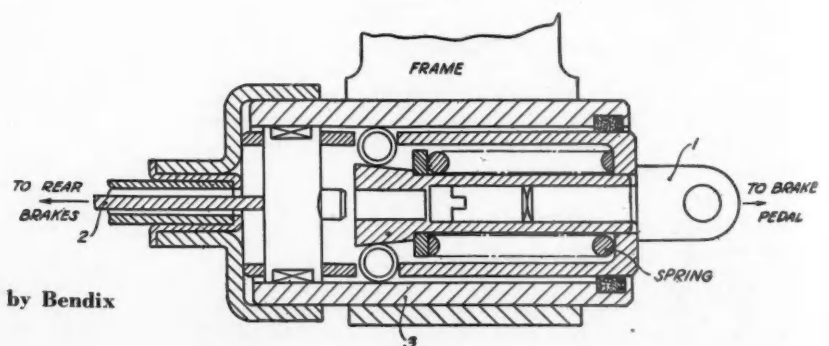


Fig. 6—The auto-brake-control used by Bendix

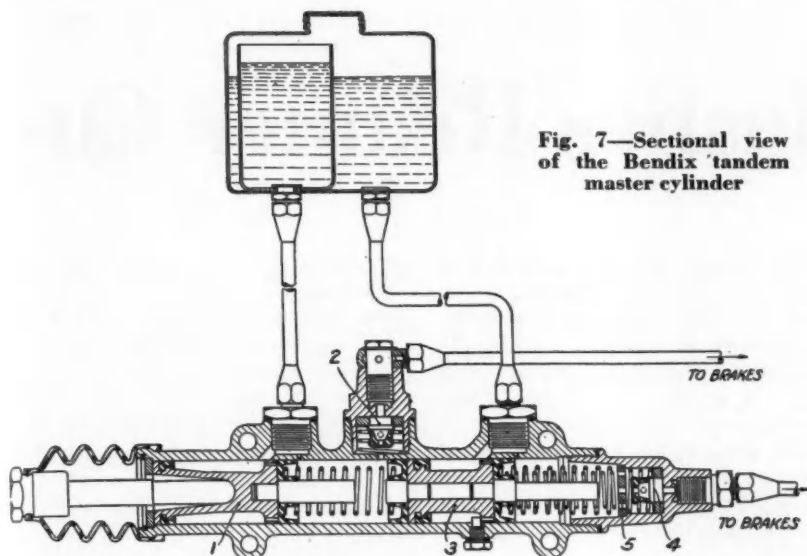


Fig. 7—Sectional view of the Bendix tandem master cylinder

conditions. The added weight on the front axle is able to take care of the increased braking torque that is applied when the Auto Brake Control comes into action.

Another advantage of such a device is that a given increase in pedal effort produces only half the rise in car retardation, compared with that which occurs before the critical point is reached, due to the fact that only the front assemblies are now affected. This has the important advantage that while a light pedal effort can be utilized for braking up to 50 per cent, which constitutes nine-tenths of the braking required, above this point a higher rate of pedal effort is required, and this prevents the undesirable results usually associated with "panic braking."

The method of operation of the Auto-Brake Control will be appreciated by reference to Fig. 6. Wedge 1 is coupled to the pedal through a compensator and the sleeve 2 is connected to the rear brakes. Wedge 1 is held against the sleeve 2 by a pre-loaded spring. As long as the pull at 1 is less than the spring pressure, the whole unit is free to slide in the housing, which is fixed to the frame, and so the pull is transmitted to the rear brakes. However, when the pull at 1 is such that the maximum desired braking on the rear axle has been reached, the spring is compressed and relative movement between 1 and 2 takes place, thus wedging the rollers against housing 3. Under these conditions any increase in pull is resisted by the frame and is not transmitted to the rear brakes.

A somewhat similar device has been introduced for use in connection with Girling brakes.

Hydraulic Brakes

Hydraulically-operated brakes of the Lockheed type continue to be fitted on Morris, Wolseley, M. G., Triumph and other cars. In general design these follow the principles which are now well known, both the operated shoes being anchored to the backing plate by either a single anchor pin or two pins.

A new form of master cylinder has been introduced which insures that certain brake assemblies will remain operative in the event of a failure in

the hydraulic system. This master cylinder is referred to as a Tandem Master Cylinder and is shown in section in Fig. 7. It provides for two independent liquid systems, one associated with the brakes on the front axle and the other with the brakes on the rear axle, and if one system should fail the other system will still remain operable. There are also two separate supply tanks combined in one unit, which prevents the complete loss of liquid if a leak occurs in one system.

On depressing the brake pedal, the primary piston 1 forces liquid through valve 2 to the brakes on one axle. The pressure in the primary cylinder causes the secondary piston 3 to move forward and forces liquid through valve 4 to the brakes on the other axle, the pressure in both systems being the same.

If a leak occurs in the primary system, primary piston 1 will move forward until the plug in its end meets the plug in secondary piston 3, after which both pistons will move forward together and create pressure in the secondary system.

Should a leak develop in the secondary system, the pressure created in the primary cylinders will first force secondary piston 3 with its projection against stop 5, after which pressure will be created in the primary system.

Thus the brakes on one axle will always remain operative even if the brakes on the other axle fail through leakage of fluid due to any of the usual causes.

Grasselli Bright Zinc Plating Process

A NEW type of zinc deposit, known as Grasselli Bright Zinc, is announced by the Grasselli Chemical Co. In contrast to the old electro-galvanizing, which in most cases gave a deposit that was dull gray and porous, this new process is said to deposit zinc in a brilliant, dense and ductile form, giving the plated article eye appeal. Thus one objection to zinc plating that in the past has made it inferior to other electro-deposited finishes has been overcome, and its value as a rust-preventive

is said to have been increased at the same time.

These improvements in the electrically deposited zinc coatings were largely brought about by the use of molybdenum, a recent development. In contrast to the older methods of electro-galvanizing, this new process operates at room temperature and higher current efficiency, it is claimed. Bright zinc deposits are obtained with current densities ranging between 15 and 100 amps. per sq. ft.

Use of Tin Jumps 20 Per Cent

According to the International Tin Research and Development Council, during the year ending April, 1936, the world apparent consumption of tin totalled 148,642 tons. This is an increase of 20.2 per cent over the figure for the previous year. The increase in British consumption was

12.8 per cent. Both the United States and the Soviet Republics showed an increase of more than three times this, France about one-fifth as much, while Germany had a decrease of 6.9 per cent. World production of tin for the same period is given as 147,099 tons, and stocks decreased.

Packard Slashes Reamer Costs

A NEW application of a flat sided cutter developed to replace the conventional or special reamer used in quantity production has been designed by the Packard Motor Car Co. This practice is protected by patents applied for, and it appears that several important producers of small tools have been licensed to manufacture reamers of this type and supply them direct to their customers.

The specific principle is illustrated by Fig. 1. The second and fourth tools (reading left to right) employ the thin, flat cutters shown in the foreground. Cutters can be made in any diameter from the smallest compatible with the method of application (naturally this is controlled by the minimum wall thickness between the bore and the root of the tooth), to larger sizes required for the bore of a connecting rod big end. In the same illustration the second tool replaces the special inserted-blade reamer at the left, while the third tool is replaced by the one at the extreme right.

This method opens the way for appreciable economies with its possibilities of replacing the expensive special reaming tools now used by Packard and other automotive machine shops. An excellent example of this is indicated by Fig. 2. The tool shown here (right) is a special reamer in use at Packard for some years. This reamer

cost the company about \$35. It has been replaced successfully by the tool shown at the left in which two of the new cutters mounted on a special bar handle the job within the same manufacturing limits and at the same speed. Here the comparison ends. The \$35 tool is scrapped after it has been reground a number of times, whereas the bar for the new cutters is a permanent fitting and cutters can be replaced at insignificant cost.

An application, illustrating the versatility of the method, is seen in Fig. 3. This is an experimental combination reamer and burnishing tool for the connecting rod big end. The reamer cutter is at the lower end while the burnishing roller cage is immediately above. Experimental runs to date indicate that this method produces a better finish than internal grinding and it is predicted that some time in the near future the grinding operation will be entirely eliminated. Note that the alignment of the bar is assured by the massive bearing which is piloted in a suitable bushing immediately above the work.

It is interesting to learn that the tendency of the bore to distort during the heavy pressure cycle of the burnishing operation is overcome most ingeniously by applying pressure at light sections.

With regard to actual detail, the cut-

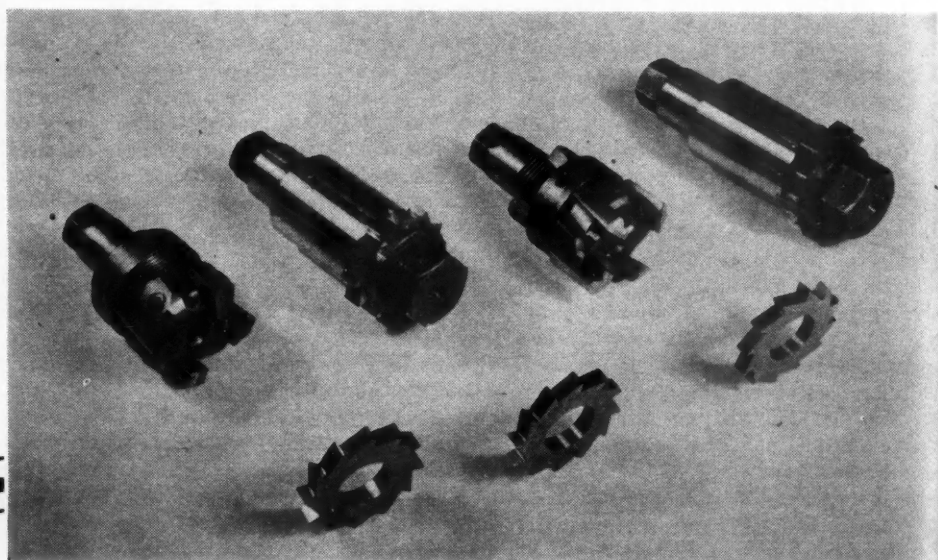
ter is a simple, thin, disk of high-speed steel with flat sides and straight cut teeth. There is no relief on the cutting edges and consequently somewhat more pressure is required to force the tool through the hole. The cutter has a straight hole without keyway, thus permitting a rather large bore without weakening the ring.

Tool maintenance is extremely simple since it is necessary only to grind the sides on a surface grinder. The disk can be ground a number of times, even to wafer thickness. The long life of a single cutter, its initial low cost, and subsequent low maintenance, contribute to a phenomenally low tool cost.

The manner of applying the cutter to the bar is another element of substantial economy. The tool holder is provided with an accurately ground face and is threaded internally to take a locking screw. This screw pilots in the cutter bore and may be tightened readily with a wrench. Ordinarily in a multiple spindle set-up, such as is shown in Fig. 3, tool sharpening is time-consuming since it is necessary to take all the tools out of the chucks. In this case, the operator simply loosens the locking screw, removes the dull cutter, and puts in a new cutter.

Some conception of the relatively low cost of the cutter may be gained from the way Packard makes them. First

Fig. 1—The second and fourth tools (left to right) employ the thin flat cutters shown in the foreground



with New Flat-Sided Cutters

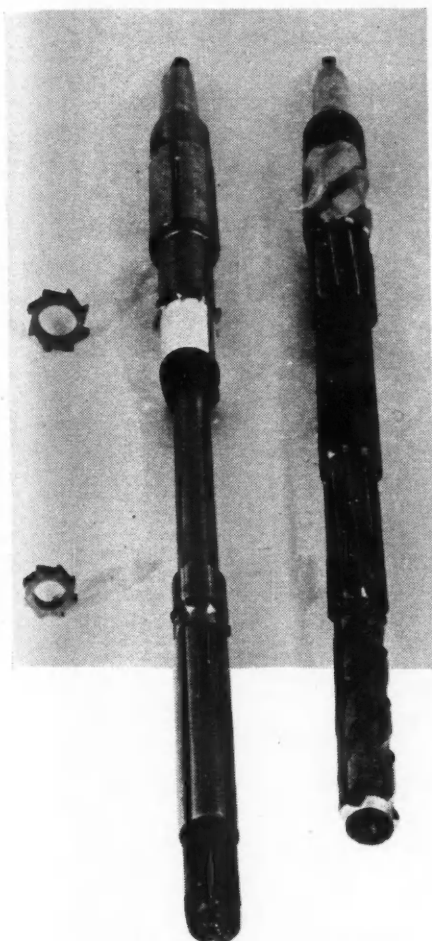


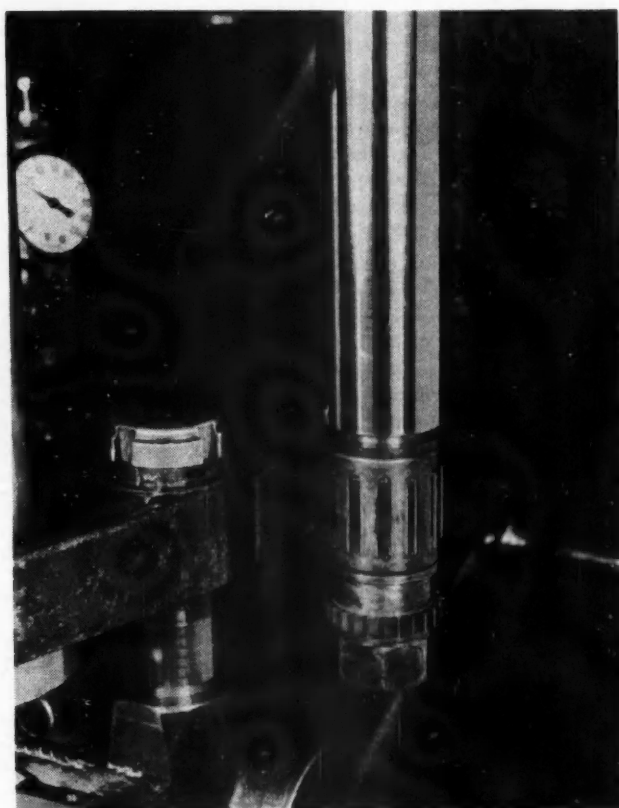
Fig. 2—The tool at the right has been replaced by the one at the left.

finish ground on a surface grinder.

In the Packard tool department it was discovered that wear of the O.D. could be corrected by "flowing" the metal in the area between the bore and the cutting teeth simply by peening the annulus. It is surprising to find that

same. Months of operation have shown that it is safe to say that the cutter will produce, on the average, no less than twice the number of holes made by the best conventional reamers. In certain special cases, these cutters yield from five to seven times the life of a

Fig. 3—To change cutters the operator loosens the locking screw. On a multi-spindle set up as shown much time is saved.



the disks are turned to the desired diameter, bored, and cut off. Then three arbors are stacked with about 25 disks each and a total of 75 cutters are rilled simultaneously. After heat treatment, the flat sides of the disks are

this operation will cause the O.D. to grow 0.003 in. or more.

These cutters are used with about the same speeds and feeds as the conventional reamers they replace, making the relative productivity about the

conventional reamer between regrinds.

This is perhaps the biggest element of economy since the set-up can run from two to five times as long before stopping for tool changes, producing acceptable holes during the interval.

A Thousand Patents Are Pooled

By an agreement reached between the principal German and English groups engaged in the production of hydraulic couplings and torque converters of the Foettinger type, nearly a thousand patents relating to such devices were thrown into a pool. Hydraulic transmissions until now have

been exploited in Great Britain by the Vulcan-Sinclair group, which holds a license from the German Ship and Machine Works of Bremen and its subsidiary, the Vulcan Shipyards of Hamburg, at which latter the first experiments with Foettinger hydraulic couplings were made. An arrange-

ment has been made also for the use of patents belonging to the Voith firm, which has had extensive experience in railroad applications, the combine lately also has acquired patents of the German General Electric Company and of Professor Foettinger himself.

Two Ford Engines Drive Night Coach

Power Plant Conversion Uses V-8 Engines Driving Through Spiral Bevel Gears Into Single Clutch and Transmission

ONE of a number of power plant conversions which have been effected recently is the dual arrangement installed in a night coach designed by the Columbia Coach Co., Los Angeles. Tests are said to indicate that this design provides a distinct advancement in efficient operation.

The power plant, composed of two Ford V-8 engines set at a 45 deg. angle to the transmission shaft, is synchronized by a system of spiral bevel gears. From these gears it drives into a single clutch and transmission. The engines are timed to give alternate impulses, providing a 16-cylinder power plant.

With the two engines, the power plant has a brake test rating of 180 hp. at 3700 r.p.m. The maximum torque is 300 ft. lb. at 2100 r.p.m. Engines are set on either side of chassis behind the rear wheels, eliminating a long drive shaft.

Charles F. Wren, instrumental in the designing of the coach, describes his reasons favoring the dual power plant. He says:

"The advantages of this type of

power unit are numerous. There is an appreciable saving in fuel consumption. On test runs the coach averaged 7 mi. per gal. This is at least 2 mi. per gal.

better than can be expected from a single heavy-duty power plant.

"Repair bills are decreased inasmuch as standard type engines are used. The problem of breakdowns in out-of-the-way places is minimized as parts for these engines may be obtained at practically any garage.

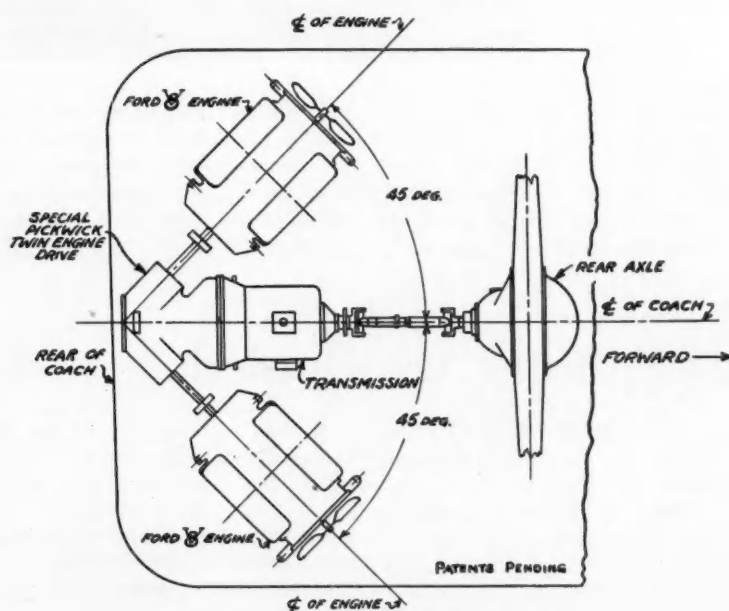
"Smoothness is another factor. The virtual 16-cylinder power plant, achieved through the synchronization of the two eight-cylinder engines, gives an unusually smooth performance for a heavy unit. Speed is also increased. Tests show that the coach can reach a maximum speed of 70 m.p.h., although a 55 m.p.h. cruising speed is advised.

"The coach may be brought from an idling speed of say 12 m.p.h. up to the cruising speed with a smoothness which practically eliminates engine and transmission wear through back-lash and whip."

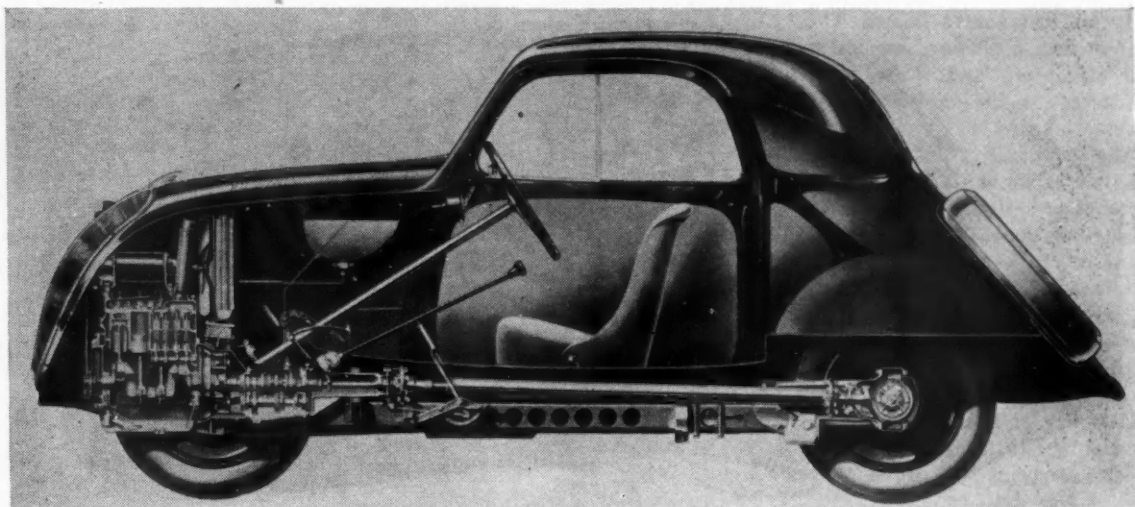
In case of breakdown of one engine the coach may be driven by a single engine. This was demonstrated in a 70 mi. run in which only one engine was used. A speed of 45 m.p.h. was attained with a single engine.



Rear View of Coach Showing Dual Power Plant Installation



Layout Diagram of Power Unit



Longitudinal section of the Fiat 500

Fiat "500," Built for Economy, Available in France and Italy

IN AUTOMOTIVE INDUSTRIES of April 18, last we published an illustrated description of a new small car developed by Fiat which at that time was in production only in France, by a subsidiary of the Fiat firm in that country. The car has now been placed in production also in Italy and an Italian correspondent has sent us a number of additional illustrations, showing some of the mechanical details. These photographs are reproduced herewith. It may be recalled that the four-cylinder engine has a displacement of less than 35 cu. in. and the car, which is built in a two-passenger type only, was designed strictly for economy. The fuel consumption with full load is given as 6 liters per 100 km., which corresponds to 39 miles per U. S. gallon, but it is stated that by careful driving it is possible to drive 100 km. on 5 liters (47 miles per gallon). The car has a four-speed transmission with silent third speed and

synchromesh shift for third and fourth speeds.

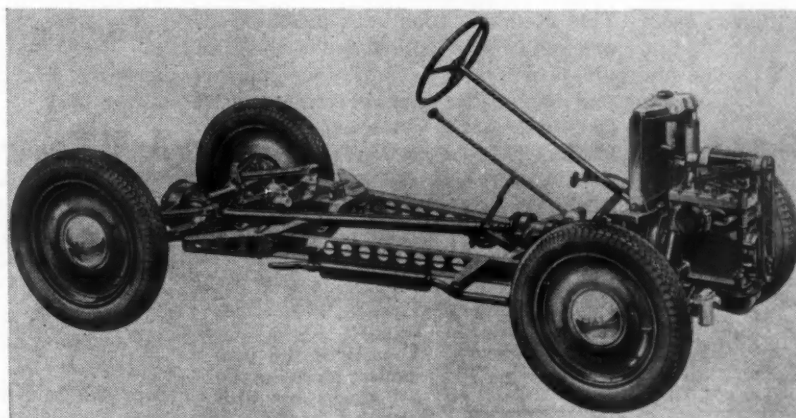
It will be seen from one of the photographs that the frame is provided with a large annular cross member at the forward end, in line with the wheel axis, from which the powerplant is supported through rubber at three points. This method of suspension eliminates the critical vibration due to the unbalanced secondary harmonic of the inertia forces of a four-cylinder engine.

Front suspension is by a single transverse half-elliptic spring which is pivoted to the upper end of the steering

head while the lower end of this same head is connected to the frame side rail by a "wishbone." The front spring is clamped by hydraulic shock absorbers. The lengths and angles of the arms are said to be so worked out that the wheel tread does not change under spring action. At the rear the suspension is by quarter-elliptic springs which make an angle with the axis of the car. Hydraulic shock absorbers are used also at the rear. Steering knuckles on opposite sides, instead of being connected by a single tie rod, have independent connections by rods which appear to run sub-

stantially parallel with the front transverse spring. The average track (average between front and rear) is only a little over 43 in. and the wheelbase, 79¼ in.

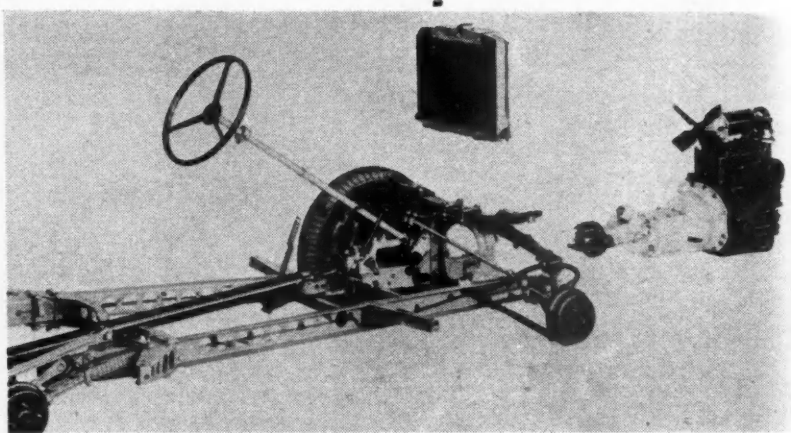
The hood of the car is in two parts, the rear part having two horizontal flaps which open in the usual manner and can be locked from inside the car. These give access to the fuel tank, the controls, and the back of the



The Fiat 500 chassis showing the location of mechanical features.

dash and the instrument board. The front part swings downward around a horizontal hinge pin and when down gives full access to the engine and its accessories.

The Fiat 500 (as this model is known) sells with an equipment including safety glass all around, electric windshield wiper, double interior vizors, rear-view mirror, speedometer, oil pressure gage, instrument board lamp with revolving screen (so that either the instruments or the whole interior of the car may be lit up) and vertical-lift, recessed door handles. The price in Italy is 8,900 lire or about \$700 and it is sold also on the instalment plan, the monthly payment being 295 lire.



The chassis disassembled to show accessibility of its components.

Propeller Shaft Minimizes Vibration

MECANICS UNIVERSAL JOINT CO., division of Borg-Warner Corporation, Rockford, Ill., has developed a new propeller shaft which is designed to materially reduce vibration, thereby cutting down shaft whip and its unpleasant accompaniments.

In the usual design the greatest concentration of mass is at the ends, and particularly at the slip joint. Vibrating forces are proportional to the product of the unbalanced mass into the distance of the center of mass from the center of support at the ends. Balance therefore is dependent on accurate alignment, reduction of the mass at the ends, and a reduction of the distance from the center of mass to the support.

As shown in the drawing reproduced herewith, the conventional stub shaft, which weighs about 2 lb. on the average, has been entirely eliminated and replaced by a thin-walled tube with internal splines that mate or mesh with splines on the outside of the slip yoke. As compared with the previous design, the total weight is about 2 lb. less and the offset of the center of mass has been greatly reduced.

Accurate alignment, which also contributes to good balance, is said to be readily obtained. The heaviest element

is now the slip yoke, which can be accurately machined. Where the short stub shaft is welded to the tube it is quite difficult to secure accurate alignment; in this case the accurately machined slip sleeve is a press fit in the tube over its entire length, and the weld at the end serves merely to lock it in place and has no effect on the alignment.

In a comparison of the new and old type shafts and their degrees of possible misalignment, it is found that the product of mass and center of mass for the new joint is 2.45 lb.-in., as compared with 10.56 lb.-in. for the old shaft. This difference becomes very significant at shaft speeds corresponding to say 60 m.p.h.

In changing the location of splines from the inside to the outside of the slip yoke, the effective diameter has been materially increased, permitting the use of almost twice as many splines. This in combination with increased diameter is said to have cut the unit pressure almost in half, thus improving lubrication and reducing thrust loads due to the operation of the slip joint. The lower pressures make it possible to decrease the hardness of the machined parts, so that all machining

can be done after they are heat treated.

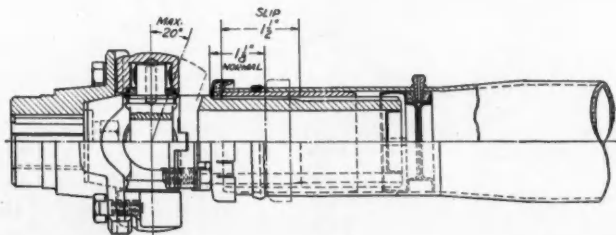
It will be seen from the drawing that the slip yoke and slip sleeve are aligned on the cylindrically ground portion of the slip yoke, so that the accuracy of the assembly is quite independent of the fit of the splines.

The construction also results in improved lubrication, not only by virtue of the lower unit pressures but also because of the availability of a generous supply of lubricant. Grease is introduced through a standard grease-gun fitting and enters between two stamped members fitted with a cork packing ring, which forms a dam preventing escape of lubricant into the tube. Grease enters the slip joint through a small hole in the stamping and is trapped by centrifugal force in the space provided, so that only a very small percentage of the charge remaining in the space between the stampings can escape through the fitting.

The new joint is in production and will be available for 1937 passenger car models.

Acid Copper

A novel method of producing copper strip and sheet has been developed recently. In the process, large belts of stainless steel composition are passed through a continuous electroplating bath containing a new acid plating solution. The copper is deposited on the belt and is stripped from the belt in the form of a sheet as it emerges from the plating tank. Copper sheets produced by this method are said to be unusually smooth and dense in structure.



Details of the propeller shaft made by Mechanics Universal Joint Co.



This radial drill press, with a 7 ft. arm, is one of several recently installed in the GM die shop at Grand Rapids.

Production Lines

very soon. According to the statistics accumulated by the correspondent many basic materials have increased in price even during the first quarter of this year. Comparing June, 1933, with June, 1936, the price of pig iron has gone up some 59 per cent; aluminum scrap has jumped 114 per cent; coke upped 55 per cent—and so it goes. It's just as some one said some time ago—coming events cast their shadows before.

Glass Fabric

Some of the glass people are spending huge sums in research aimed at applications of spun glass or more literally, extruded glass fibers. Already these fine spun glass fibers have found a ready application for filtering air. Now it has been discovered that heavy blankets of the material form an excellent medium for thermal insulation and acoustic insulation. It is quite likely that the insulating properties may be of real consequence in auto body construction, particularly at the dash and on the steel roof panel. Another interesting commercial development is the spinning of glass fibers into an artistic fabric for places where the material is not subjected to abrasion or flexing. We suspect, therefore, that it may be possible to produce a blanket form-fitted for the ceiling of the car, serving as a thermal and acoustic insulation, and replacing the head lining.

Motor Paint

Engines for Dodge cars and trucks are sprayed with an aluminum base paint which serves the purpose of increasing heat conductivity of metal surfaces both by convection and reflection.

On Moly

A new bulletin on the effect of molybdenum on the properties of gray iron has just been issued by Climax Molybdenum. It features a generous use of photomicrographs comparing

plain iron with moly iron. In general, the moly iron has smaller graphite particles more evenly distributed in the matrix. Pearlite has been changed to a sorbite. Physical property tables given in the bulletin really tell the story best. We can get you a copy.

Grows Crystals

Rochelle salt crystals have been formed, on a commercial basis, by one of the leading laboratories and are being impressed for use in certain technical equipment. One important application is on a new machine designed to measure the roughness of machined surfaces. The machine is said to be considerably less expensive than anything available today.

Ten Times

The fan belt is an unobtrusive part of an engine and yet a good deal depends upon its ability to keep going. While talking with one of the fan belt experts the other day we learned a very interesting thing. Just a couple of years back a fan belt was considered good when it withstood a life test of 40 hours continuous running. To be just good today, it has to live 400 hours at much higher speed. Which is just another slant on the scientific research aimed at important trifles.

Going Up

A letter from an old line iron founder gives evidence that the price of gray iron castings must of necessity go up

Hats Off

A well-known automotive engineer who spent some months in Europe this year told us that his trip was needed to show him how important is the parts maker to the American car builder. He feels that the difference, basically, between our cars and European cars will be found in the contributions of the parts makers. Independent research, constant refinement, and constant development of new things—these activities of the parts makers are responsible for much of the advance in automotive engineering.

Fuel Economy

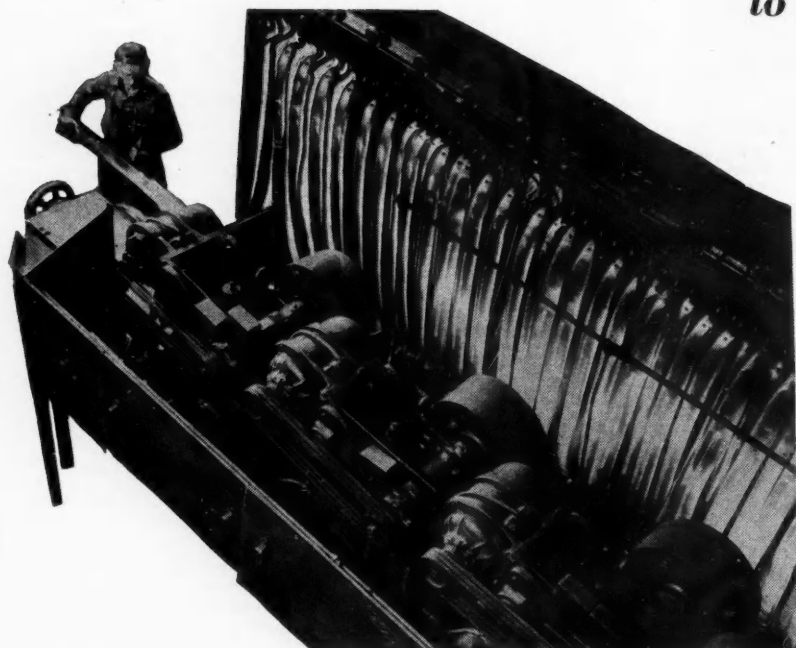
More efficient utilization of fuel will be an outstanding feature of 1937 cars and by the same token, fuel economy will constitute much of the stuff of the advertising and publicity announcements. We are assured by one who is an authority that patient attention to details and refinements can do much to increase the fuel economy of any car and that better economy is possible without sacrificing our standards of performance. You can leave it to the buying public to pick the winners.

—J. G.

MANUFACTURING
MANAGEMENT
METALLURGY

600 Bumpers That Can Take It

*are on their way each hour
to Chevrolet cars and trucks*



Left—

Chevrolet bumpers are polished by being passed through three lines of automatic polishing wheels, 14 wheels in each line. Bars from the conveyor are being removed and placed on the belt that carries them along under the high-speed automatic polishers, three of which are shown.

Below—

Chevrolet's bumper plants, at Detroit and Saginaw, are now making 600 bumpers an hour. Here a heated blank, taken from an electric furnace, is ready to pass it to the operator of the forming press, who is ejecting a shaped and perforated front bumper bar from his machine.

BUMPERS for Chevrolet cars and trucks are now being produced at the rate of 600 an hour in the company's two specialized plants devoted exclusively to the manufacture of these units.

The nickel and chromium plating of bumpers is done in departments that handle bumpers exclusively. Each plant, therefore, is permitted to use methods of plating and polishing peculiarly fitted to the material and to the heavy-duty finish required for bumpers, the most vulnerable units of a car.

Bumper bars are trimmed to proper shape and formed in heavy machinery in a separate building, from which they are carried in a constant stream on overhead conveyors to the finishing plant. Here they are loaded on carriers, holding eight bumpers apiece, on which they are passed through five different tanks, in which they are cleaned and washed.

Polishing operations follow, preparatory to the plating. The bumpers

travel flat on a belt conveyor which carries them under polishing wheels, arranged in lines containing 14 polishing machines. Polishing wheels are 16 in. in diameter, and run at 1750 r.p.m. As the bumpers leave the third line of polishers they pass before inspectors, who remove any pieces not perfectly finished. Defective bumpers are cor-

rected by operators at special machines.

After being polished, the bumpers are loaded on automatic carriers and passed through nickel-plating tanks, after which they are buffed on three lines of automatic machines. Finally they go through the chrome-plating tanks.



New DEVELOPMENTS

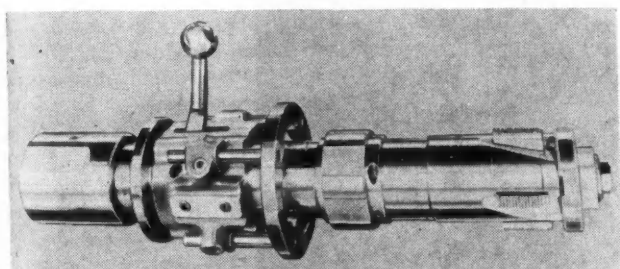
**Automotive Parts, Accessories
and Production Tools**

Collapsible Tap

Landis Product Features Pilot Arrangement

Landis Machine Co., Waynesboro, Pa., has recently marketed a collapsible tap with pilots to insure concentricity of the thread with other parts of the casting.

The illustration shows the pilots applied to a Landis style LT collapsible tap. The body of the tap is of special length to reach to the bottom of a deep hole in a steel casting tractor part. The pilot ahead of the chasers lines up the tap with bore of the hole which is to be tapped. The rear pilot is made in the form of a collar fitting over the tap body. It fits a reamed hole near the top of the casting with which it is necessary to maintain concentricity.



Landis collapsible tap

Both pilots are made of steel, are hardened and ground, and are made to revolve with the work in order to prevent siezing in the work.

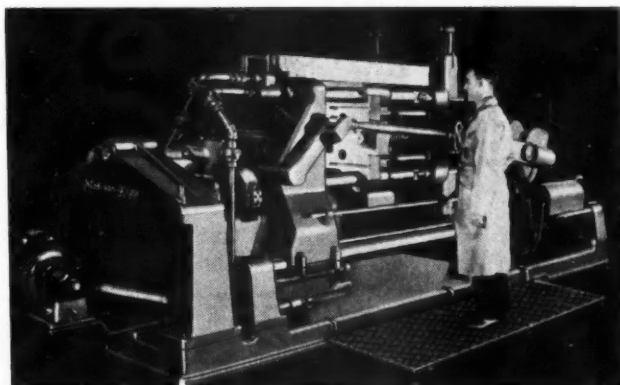
Similar pilot arrangements can be furnished with the Landis style LT collapsible taps in all sizes from 1 3/8 in. to 12 in., inclusive.

Radiator Tubes

Equipment by K & R Performs Several Operations

Among the equipment recently supplied to the radiator industry by Kane & Roach, Inc., Syracuse, N. Y., is the set-up illustrated here, combining a cold-roll forming machine, tinning machine, and rotary cutoff. This was built

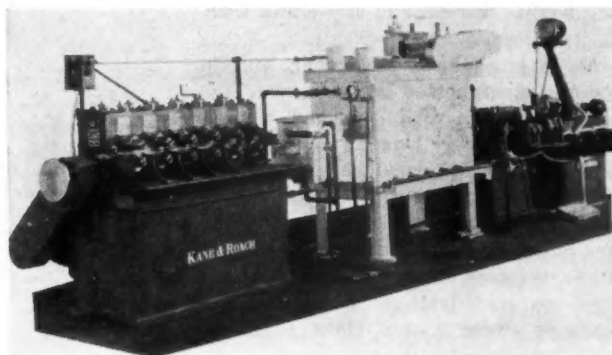
Madison-Kipp die casting machine



for the Russian Commission for performing the following operations: Forming rectangular lockseam radiator tubes from brass strip stock 0.0075 in. thick, the tube being 0.531 x

0.093 in. in section; producing tube of same section from stock 0.0095 in. thick; also a round lockseam overflow tube 0.315 O.D., rolled from brass strip 0.015 in. thick.

**Kane & Roach
equipment for the
radiator manufacturers**



Productivity is of the order of 110 ft. per min.; the tube passing from the forming machine to the tinning machine where it is solder-coated 0.001 to 0.00125 in. Next it goes through the straightening unit and then to the rotary cutoff where the rectangular tubes are cut off into 20% in. lengths.

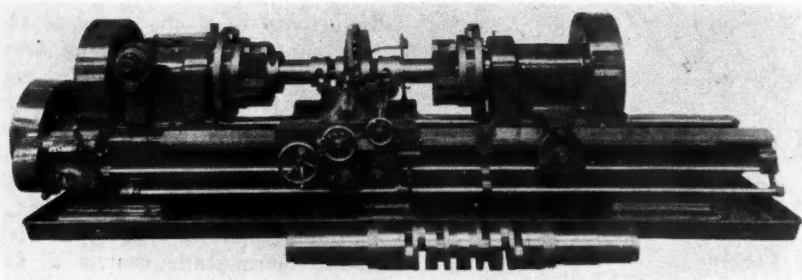
The tinning machine is equipped with automatic thermostatic control to assure uniformity.

Die Casting

Madison-Kipp Brings Out Automatic Die Caster

Madison-Kipp Corp., Madison, Wis., has recently brought out a large automatic die casting machine for handling alloys of zinc, aluminum, lead, or tin. The No. 8 machine is 22 1/2 x 28 1/2 in. with a metal pot capacity of 1200 lb. of zinc alloy. It weighs 30,000 lb., is 204 in. in length, and 72 in. in width.

The new machine operates on the same general principle of the No. 4 and the No. 5 machines. It is driven by a 7 1/2 hp. multi-speed motor, first through a silent chain drive, then through worm and worm wheel. The reciprocating action for opening and closing the dies and for automatically providing the proper dwell period for shooting the casting is accomplished through the patented dwell crank cam units which are also standard equipment on the other models.



LeBlond 30-in. lathe

Gear Speeder

Machine designed to simulate operating conditions

A new gear speeder designed to closely simulate actual operating conditions in the testing of gears for quietness, has recently been announced by the Michigan Tool Co., 7171 McNichols Road, East, Detroit, Mich. The machine is so designed that pairs of production gears can be run together both forwards and reverse, under loads, while being checked. This is obtained by providing the speeder with two spindles, each having its own drive and its own brake, all controlled through a single hand-wheel. Full drive with or without brake in each direction is obtainable.

It is said that the use of the speeder makes it unnecessary to continuously check production gears for eccentricity, involute, helix angle, spacing, etc., unless an unusual run of noisy gears is encountered.

Crankshaft Lathes

Design by LeBlond for Turning Heavy-Duty Crankshafts

The R. K. LeBlond Machine Tool Co., Cincinnati, Ohio, has developed a heavy-duty universal crankshaft lathe for turning Diesel and other heavy-duty crankshafts. It is of rigid design, capable of handling a wide variety of crankshafts. It is adjustable for any throw up to $3\frac{1}{2}$ in. It can be indexed to any division for two, three, four, six, or twelve positions. A change of tooling adapts the lathe to any crank within its range.

A large helical face gear on the spindle is supported between two Timken bearings, with the end of the spindle floating lengthwise in SKF double roller spherical roller bearings. Counterweights to compensate for off balance weights of fixture and crank are mounted on both the head and tail-stock spindles. All of the shafts are also on anti-friction bearings. The variable speed motor gives a grada-

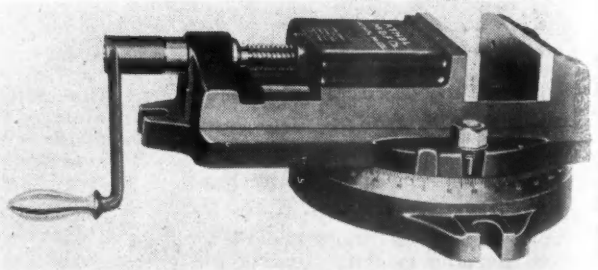
tion of speeds for the most productive output within the range of the lathe. The drive from the motor is through vee belts to a multiple disk clutch. A disk brake built in the same unit, pro-

Michigan Tool Co.
Gear Speeder

vides instant stopping of the spindle when the clutch is released.

The bed has the LeBlond improved compensating vee on the front way, providing a carriage bearing surface

angle settings are easily and conveniently handled. Removed from the swivel base, the vise is ideally adapted to drill press and many other types of use.

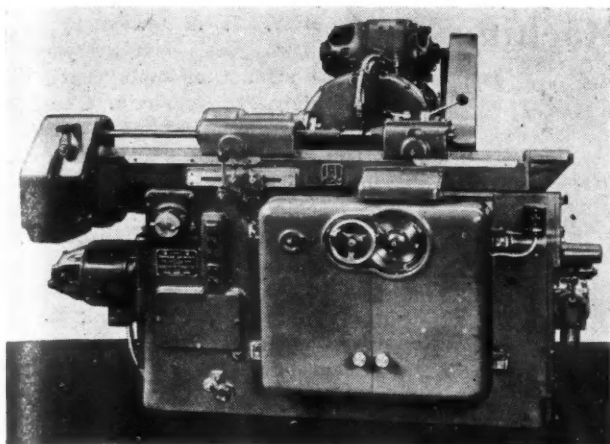
Athol Machine
and Foundry Co.
milling machine
vise

about four times as great as usual practice. The combination of angles on the front guiding way provides a wide thrust bearing at right angles to the tool pressure. The rear bearing is flat, and the carriage is gibbed to the bed its whole length.

Vise

Milling Machine Vise Has Been Announced by Athol

A new milling machine vise with an easily removable swivel indexing base, announced by Athol Machine and Foundry Co., Athol, Mass., provides for an unusually wide range of general machine shop uses. Used with the indexing base, milling machine and other operations requiring accurate



J & L thread grinding machine

The indexing base is graduated over 180 deg., extending 90 deg. each way from zero. Two clamp bolts hold the vise bed in position on the swivel base.

The swivel base milling machine vise is available in two sizes, with 4 in. jaw and with 6 in. jaw.

Brazing Furnace

Improved Method for Tipping Sintered Carbide Tools

An electrically operated hydrogen brazing furnace designed for the tipping of sintered carbide cutting tools is announced by the Firthite Division of the Firth-Sterling Steel Co., McKeesport, Pa. Known as the Firth Braze-Rite Furnace, it provides for a simplified and improved method of brazing carbide blanks to steel shanks insuring a positive, permanent braze. With the furnace, tools of a wide variety can be brazed in much less time than has heretofore been required since heat is localized at the end of the tool on which the carbide blank is to be mounted, eliminating the necessity of heating the entire shank.

The furnace is provided with two separate muffles, each of 2-in. capacity,

made of a high heat-resisting alloy, developed to withstand brazing temperatures and which, in turn, will offer exceptionally long life. Tools varying in size from small bits up to those having 1½-in. square shanks can be accommodated.

Either 110-220 volts AC or DC can be used for operation of the furnace. When AC is employed a tap transformer is supplied and when DC is used the control is through a rheostat. A direct-reading pyrometer is mounted at the rear of the furnace which enables the temperature to be noted at all times. Through the electrical control and pyrometer reading it is possible to maintain correct temperature at all times.

Thread Grinding

J & L Machine Embodies New Process

The J & L Automatic Thread Grinding Machine, recently brought out by the Jones & Lamson Machine Co., Springfield, Vt., embodies a new grinding process designed about the truing device as the primary element. With no attention from the operator and without disturbing the size adjustment to which the wheel continually is set, the wheel is kept sharp continuously throughout its effective life.

The standard machine is designed to grind up to and including threads 8 in. in diameter and up to and including a maximum thread length of 9 in. This 9 in. of threading may be ground on any part of work 24 in. long. The standard machine is made to swing work of 11½ in. maximum diameter with a maximum work length of 31 in. between centers. The machine spindle is bored 1 11/16 in. in diameter to permit grinding threads up to 1½ in. in diameter on long work, such as shafts, etc., when held in a chuck. It will grind single, double, triple, quadruple, or sextuple threads within its range.

The machine will grind from the solid or from previously roughed threads. Twenty-inch grinding wheels are furnished as standard equipment.

A rheostat is furnished and graduated to correspond with graduations on the wheel-truing device so that, as the wheel decreases in size, the rheostat may be changed to maintain the proper peripheral speed.

Gear Checker

Fellows Gear Device Checks Steering Worms

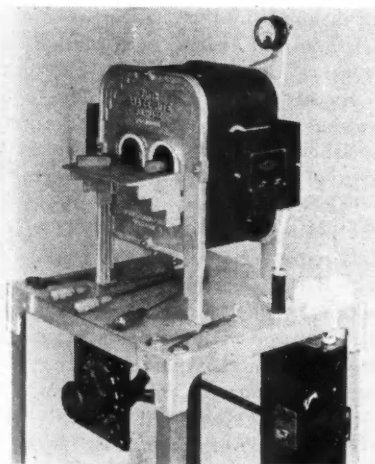
The Fellows Gear Shaper Co., Springfield, Vt., has recently placed on the market a new type Red Liner for checking hourglass steering worms. It indicates the amount of clearance between the worm and sector or roller with index lines for each quarter revolution of the worm. This machine operates on the same principles as the regular Red Liner used for checking external and internal gears, with the



Fellows steering worm checkers

exception that it is intended for hand operation only, and it is arranged with a 40 to 1 magnification for English and 50 to 1 for metric measure.

A ball point plunger held in a carrier is brought in contact with both sides of the worm thread and this sets the carrier in the correct position for both angle and center distance. A light bulb in the cabinet is provided for illumination to facilitate making this setting and to inspect the location of



Firth Braze-Rite furnace

contact of worm and sector teeth or roller. Two size blocks are employed: one, sets the carrier at the correct angle; another, not shown, located at the rear of the machine sets the carrier at the correct center distance.

In operation the sector or roller holder is set to the correct center distance and angular position by size blocks, as previously explained, and when a master sector is employed the graduated dial on the operating handle is set at zero. If a master roller, however, is employed, then the graduated dial is rotated 180 deg.

Degreasing Machine

Dodge Div., Chrysler Corp., Uses Large Capacity Model

Dodge Division, Chrysler Corp., uses what is said to be the largest degreasing machine in this country. Fenders and sheet metal parts are degreased in this equipment before being bonderized. The parts to be cleaned are carried through the heavy vapor of a chlorinated organic solvent.

This Detrex Degreasing Machine is built by the Detroit Rex Products Co.,

Detroit, Mich. It is served by two Monorail Conveyors, each carrying a continuous stream of metal parts at approximately 20 ft. per min. Cleaning is automatic with a normal production of 17,000 lb. per hour and a peak production of 60,000 lb. per hour.

The machine is 65 ft. 5 in. long, 10 ft. 5 in. wide and 19 ft. 4 3/16 in. high.

The vapor line in this Detrex Degreaser stands about 8 ft. above the floor and is controlled by a cold water condenser that condenses all vapors above that point, the condensate flowing back into the boiling chambers. While the machine is operating the solvent is kept at a boiling temperature by means of steam coils running along the bottom of the boiling chamber.

In addition to the degreasing machine, a still is used to reclaim dirty solvent at the rate of 50 gal. per hr. The machine automatically distills about 250 gal. of solvent per hr.

Statistics issued by Bureau of Mines show that 352,749,000 lb. of carbon black were produced in the United States during 1935. The total is larger than that for 1934, and is exceeded only by those for 1929 and 1930, the production for the latter year having reached 379,924,000 lb. The demand in 1935 was excellent, home and export sales reaching 387,536,000 lb., hence stocks at the plants were materially reduced. Some 75 per cent of the output was produced in the Texas Panhandle area. Carbon black is used very largely for the rubber mixtures from which pneumatic tires are made.

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surreptitious assistance which seems to be open to Italy. On this side of the water one David Dubinsky, chief of the International Ladies' Garment Workers' Union and ardent supporter of the administration, has remitted \$5,000 to the Spanish government. The conservatives of Spain are seeking to accomplish with bullets what the conservatives of America hope to accomplish this fall with ballots. As a threat to world peace the Spanish affair is infinitely more serious than the Ethiopian war or Hitler's march across the Rhine. This is a full fledged war on the continent of Europe with intense sympathies aligned on both sides and a desperation of purpose among the combatants which will proliferate those "incidents" that provoke the entrance of other parties. Will the United States have the sense and will power to stay out of this one?



In Mechanics Roller Bearing Universal Joints, integral keys transmit the torque. These keys, not bolts or screws, do the driving. Design is simple and compact, machining highly accurate, balance assured, lubrication provision generous, assembling simple. Mechanics Roller Bearing Universal Joints are rugged, dependable, economical. Used in leading passenger cars, trucks and busses. Investigate. Write, today, for complete information on Mechanics Universal Joints.

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